6.0 SECTION 4(f) EVALUATION

The U.S. Department of Transportation (USDOT) Act of 1966 included a special provision, called Section 4(f)[1], which stipulated that the Federal Highway Administration (FHWA) and other USDOT agencies cannot approve the use of land from publicly-owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent alternative to the use of the Section 4(f) resource and the action includes all possible planning to minimize harm to the property resulting from the use.

What is Section 4(f) and what resources does it protect?

Section 4(f) provides protection for significant publicly owned parks, recreation areas, historic properties (eligible for or listed on the National Register of Historic Places), and wildlife and waterfowl refuges from conversion to a transportation use. FHWA may not approve such a conversion unless a determination is made that:

- The action only has a de minimis affect to any 4(f) property;
- There is no feasible and prudent alternative to the use of land from the property; or
- The action includes all possible planning to minimize harm to the property resulting from each use.

The Land and Water Conservation Fund Act (LWCFA), passed by Congress in 1965, established the Land and Water Conservation Fund, a matching assistance program that provides grants, which pays half the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) of the LWCFA prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of Interior's National Park Service (NPS). Because it is not uncommon for recreational resources to receive LWCFA funding, Section 6(f) may be part of USDOT Act Section 4(f) evaluations when recreational resources are involved.

The applicability of Section 6(f) resources was examined for the project. The Florida Department of Environmental Protection's (FDEP) Division of Recreation and Parks indicated that none of the state-owned lands located within the project area were purchased with LWCFA funding. This was independently confirmed through a review of information available through the National Park Service LWCF website[2].The City of Port St. Lucie (City) indicated that Kiwanis Park, which is adjacent to one of the build alternatives (Alternative 2D), was not purchased with LWCFA funding. Thus, Section 6(f) does not apply to these lands. Within the study area, several community resources, including neighborhood parks, were identified [Section 4.1.1 (Sociocultural Effects Evaluation)]. These neighborhood parks are outside the immediate project area and would not be directly or indirectly affected by the project. Thus, for Section 6(f) purposes, they will not be considered further in this evaluation. The remainder of this section will involve only Section 4(f) provisions.

[1] Section 4(f) of the USDOT Act was re-codified and renumbered as Section 303 (c) of 49 USC. FHWA (and other agencies) continues to refer to this statute as Section 4(f) to avoid confusion.
[2] http://waso-lwcf.ncrc.nps.gov/public/index.cfm

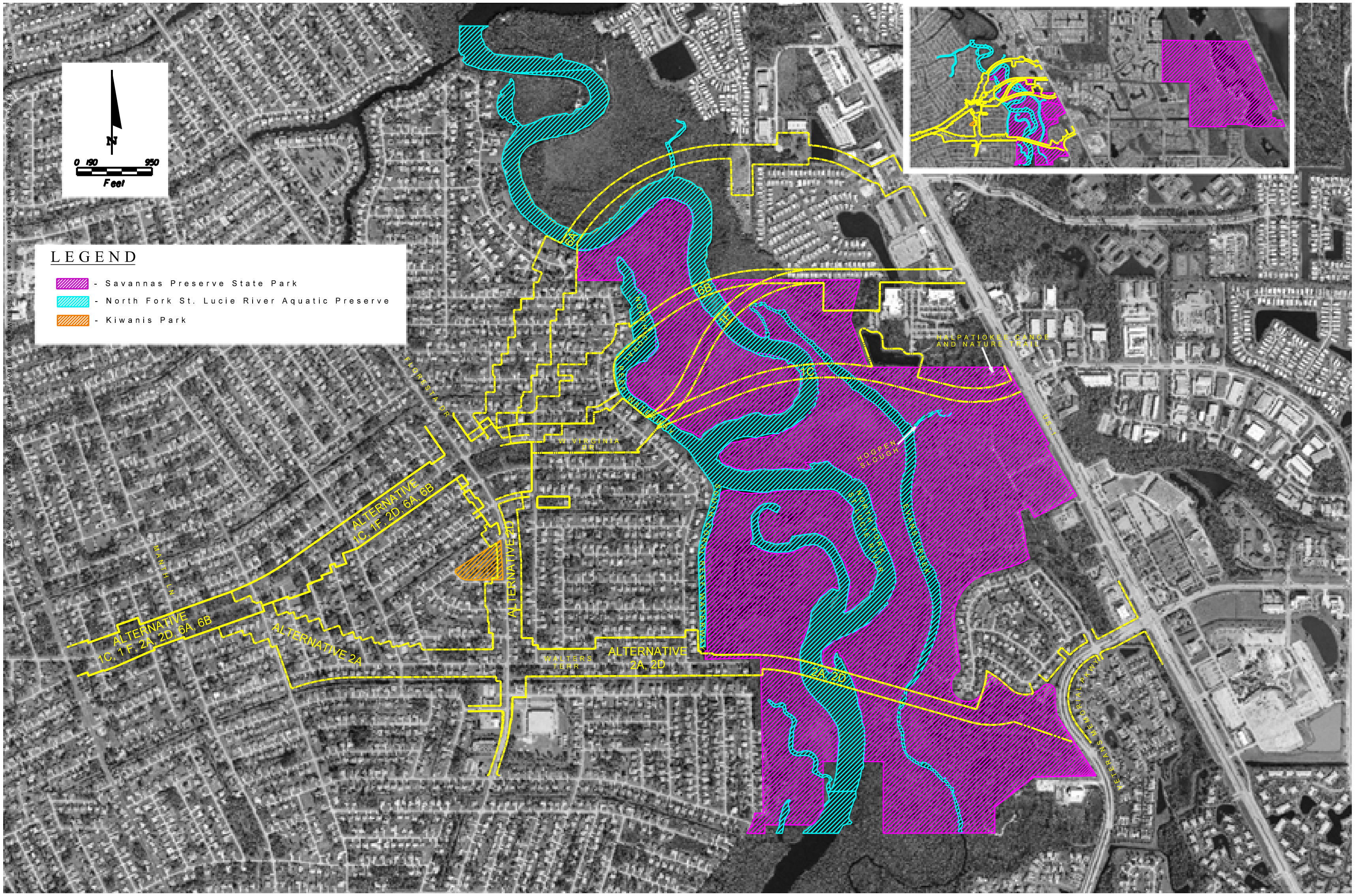
Section 2.0 (Purpose of and Need for Action) of this Environmental Impact Statement (EIS) discusses the project purpose and need. As documented in Section 3.0 (Alternatives Including Proposed Action) and summarized briefly in Section 6.2 (Avoidance Alternatives) below, several corridors and alternatives have been rejected because they were not feasible and/or not prudent[3]. However, the standards for evaluating and eliminating alternatives under Section 4(f) are different than those under the National Environmental Policy Act (NEPA). Under NEPA, all reasonable alternatives must be explained and objectively evaluated. Any alternative may be selected or rejected as long as it is sufficiently documented and justified. Under Section 4(f), unless the use of a Section 4(f) property is determined to have a *de minimis* impact, the use of land determined to be a Section 4(f) resource may not be approved unless there is no feasible and prudent alternative for such use. Further, the use of such property may be approved only if all possible planning to minimize harm is included (e.g. minimization, mitigation, or enhancement measures) For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f). This project does not qualify as a *de minimis* impact project. If there is no feasible and prudent alternative that avoids Section 4(f) properties, only the alternative that causes the least overall harm can be approved. Least overall harm must be determined in accordance with the factors outlined in 23 CFR Section 774.3(c)(1) of Section 4(f). As described in Sections 2.0 (Purpose of and Need for Action) and 3.0 (Alternatives Including Proposed Action), the No Build, six build alternatives and various avoidance and minimization options were evaluated for this Section 4(f) evaluation.

6.1 Section 4(f) Properties

The U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (USEPA), National Marine Fisheries Services (NMFS), South Florida Water Management District (SFWMD), Florida Fish and Wildlife Conservation Commission (FWC), and FDEP have indicated that the project was located within the boundaries of the North Fork St. Lucie River Aquatic Preserve (AP) and the Savannas Preserve State Park (SPSP). As part of the data collection, a third Section 4(f) resource was identified, Kiwanis Park, a neighborhood park which is located within the project area (**Figure 6.1**). A Determination of Section 4(f) Applicability (DOA) was submitted to the FHWA to determine whether the provisions of Section 4(f) applied to each of the three resources. It was determined that Section 4(f) applies to these three properties within the study area (**Appendix A**)[4]. The rights of way of all six build alternatives under consideration are located within the boundaries of one or more Section 4(f) properties (**Table 6.1**). However, it must be noted that even though a project may be located within a Section 4(f) property, as in the case of a proposed bridge, Section 4(f) generally would apply only if piers or other support structures are physically located within the property (where land from a Section 4(f) property would be permanently incorporated into the transportation facility). If the bridge can completely span the Section 4(f) property and can avoid the placement of support structures, "proximity impacts" must be evaluated to determine if the bridge would result in impacts so severe that the protected activities, features, or attributes that qualify the property protected under Section 4(f) are substantially impaired. The investigation of avoidance alternatives and types of impacts/uses of Section 4(f) properties are evaluated in subsequent sections.

[3] An alternative is feasible if it can be built as a matter of sound engineering judgment; an alternative is prudent if it does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property (Source 23 CFR Section 774.17 (Feasible and Prudent Avoidance Alternatives).

[4] DOA for the AP and the SPSP received from FHWA via letters, dated 12/10/2007 and 2/24/2009; DOA for Kiwanis Park received from FHWA via email on 4/13/2009 (**Appendix A**).



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Section 4(f) Properties within the Project Area

Figure 6.1

Table 6.1 Is the Build Alternative Right of Way Located within the Boundaries of a Section 4(f) Property[1] ?

Section 4(f) Property	Alternative					
	2A	2D	1C	1F	6B	6A
AP	Yes	Yes	Yes	Yes	Yes	Yes
SPSP	Yes	Yes	Yes	Yes	Yes	No
KP	No	Yes	No	No	No	No

AP = NFSLR Aquatic Preserve; SPSP = Savannas Preserve State Park; KP = Kiwanis Park

[1] This table indicates whether the alternative right of way is located within the boundaries of a Section 4(f) property. It does not indicate that the alternative would have a use or a constructive use as defined by the Section 4(f) statute.

6.1.1 North Fork St. Lucie River Aquatic Preserve

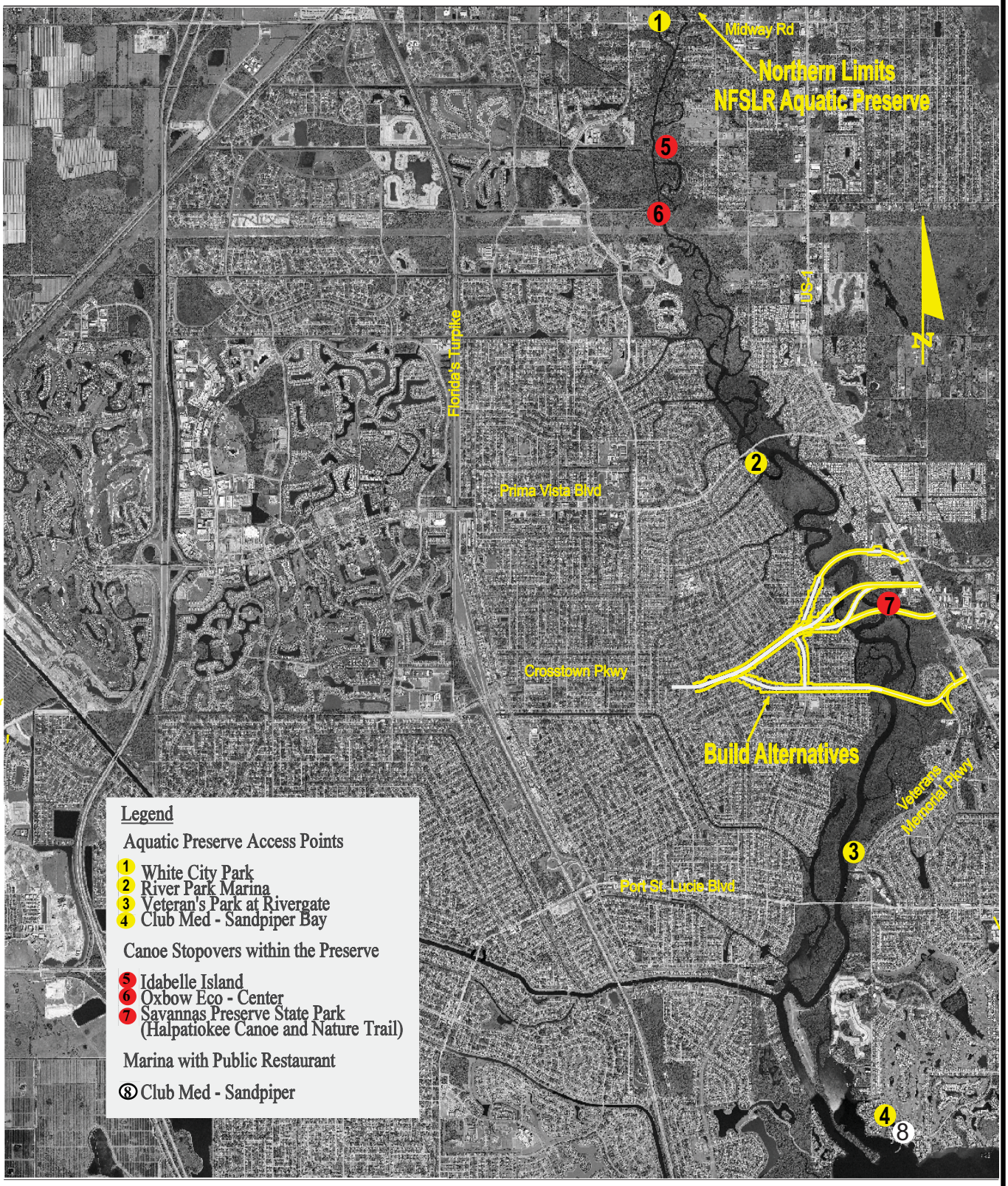
The North Fork St. Lucie River Aquatic Preserve (AP) is located primarily within St. Lucie County, with a large portion located within the City of Port St. Lucie. The southern boundary of the AP is located just south of the Martin County line (over five miles south of the study area to Jenkins Point and Coconut Point in Martin County) and the northern boundary is south of Midway Road (CR 712) in White City (over three miles north of the study area). In its entirety, the AP encompasses 2,972 acres of surface water area along 16 river miles of the NFSLR[5]. The project area and all build alternatives intersect with and cross the AP.

The FDEP is the agency that has jurisdiction over the AP and has completed an update to its management plan[6]. According to information provided by FDEP, the portion of the AP within the DOA study limits (from Port St. Lucie Boulevard to Prima Vista Boulevard) is 234 acres. The portion of the AP in the project area is located within the main and secondary channels of the NFSLR, Evans Creek, Hog Pen Slough, South Coral Reef Waterway, and North Coral Reef Waterway (**Figure 6.1**). The NFSLR is defined in statute as Sovereignty Submerged Lands (SSL) located waterward of the ordinary or mean high water (MHW) line, to which the State of Florida acquired title on March 3, 1845 [258 Part II Florida Statutes (FS)]. The AP was adopted by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) on March 30, 1972, by resolution, and its designation is described in the Official Records of St. Lucie County in Book 201, pages 1676-1679. In practice, under the rules for SSL Management [Chapter 18-21 Florida Administrative Code (FAC)], the SSL and AP boundary is established waterward of the ordinary or MHW line. The MHW within the project area was determined June 16-18, 2003, using the methods described in the technical support document titled *Wetlands Evaluation Report*. The boundaries of the AP within the project area are shown on **Figure 6.1**. The instrument surveyed boundaries of the AP (or SSL) will be determined during the permitting phase.

The public can access the NFSLR from four public boat ramps along the AP and one canoe/kayak access point at a dock at the end of a nature trail on Evans Creek (**Figure 6.2**). The River Park Marina, a public boat ramp owned by St. Lucie County, is located along Prima Vista Boulevard. The Veterans' Memorial Park Boat Ramp is another public boat ramp located at Rivergate (on Veterans Memorial Parkway north of Port St. Lucie Boulevard). A third public boat ramp is located in White City Park. A fourth boat ramp is located at Club Med – Sandpiper. These four heavily used boat ramps and associated facilities (restrooms,

[5] http://www.dep.state.fl.us/coastal/sites/northfork/default.htm; accessed on 5/10/2012.

[6] FDEP: North Fork St. Lucie River Aquatic Preserve Management Plan (2009). Available on FDEP's website: http://www.dep.state.fl.us/coastal/sites/northfork/management/plan.htm; accessed on 5/10/2012



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Public Access Points and Facilities within the NFSLR Aquatic Preserve

Figure 6.2

picnic tables, boat docks, and nature trail) are located outside of the project area and would not be affected by any of the build alternatives. A fifth public access point is provided at the Halpatiokee Canoe and Nature Trail (Halpatiokee), where a canoe/kayak stopover at the end of a nature trail is located along the western side of U.S. 1, north of Village Green Drive (**Figure 6.2; Photo 6.1)**. This access point/facility is located within the project area. In addition to the public access boat ramps, numerous privately-owned family docks are located within the AP, including many within the project area along the North Coral Reef Waterway, the South Coral Reef Waterway, and the NFSLR.

Photo 6.1 Trailhead at Halpatiokee Canoe and Nature Trail

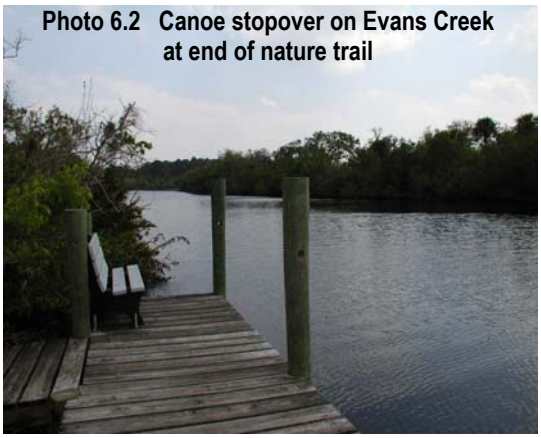


Photo 6.2 Canoe stopover on Evans Creek at end of nature trail

The FDEP issued a statement of significance regarding the AP, dated July 25, 2007, and stated that the primary management objective of the AP is to "maintain and enhance the existing wilderness condition for the enjoyment of future generations and for the propagation of fish and wildlife and public recreation" (**Appendix A**). The Halpatiokee facility was not specifically mentioned in this statement. According to the FDEP letter, popular user group activities within the AP include recreational boating (including kayaking and canoeing), commercial and recreational fishing, nature watching, photography, and participation in professional ecotours. The FDEP also noted that usage data of the AP in terms of numbers of visitors has not been collected by FDEP.[7] However, based on observations made during the various field investigations, the AP is a popular recreational attraction, especially on weekends and holidays.

The Halpatiokee facility provides a canoe/kayak stopover at a small dock at the end of an unpaved trail on Evans Creek (**Photo 6.2**). Of the five access points to the AP, Halpatiokee is accessible only to the most determined/prepared of canoeists and kayakers (and hikers and fishers).[8] The canoe dock is accessed via an unimproved trail that is approximately 1,600 feet (approximately 0.3 miles) from the parking area. It passes through floodplain wetlands that are inundated/flooded most of the year (**Photos 6.3**). The management plan for the AP does not discuss any type of improvement for this facility and plans for improvement have not proceeded beyond staff discussions.[8] Discussions with SPSP personnel indicated that park staff visit the park daily to open the gates and occasionally walk the trails to pick up litter and to identify problems.[9]

Photo 6.3 Typical view of Halpatiokee Canoe and Nature Trail

[7] Also reiterated in minutes from a meeting between the City and FDEP, dated October 5, 2010 (**Appendix I**).
[8] Record of Telephone Conversation, Paul Rice, dated October 6, 2010 (**Appendix I**).
[9] Meeting minutes with FDEP staff, dated July 10, 2012 (**Appendix I**).

As part of the coordination for the compensatory mitigation plan for the project, the FDEP agreed to relocate the trail and access point approximately 1,000 feet to the south, which would allow direct access to the AP.[10] Trail relocation plans have been developed that would improve public access to the AP, especially for canoe/kayak access [Section 6.7 (Compensatory Mitigation for Section 4(f) Uses)]. Thus, even though the relatively inaccessible Halpatiokee facility is currently the only public access point to the AP within the project area (but not the only public access point to the AP), it is not essential that Halpatiokee remain at its current location.

6.1.2 Savannas Preserve State Park

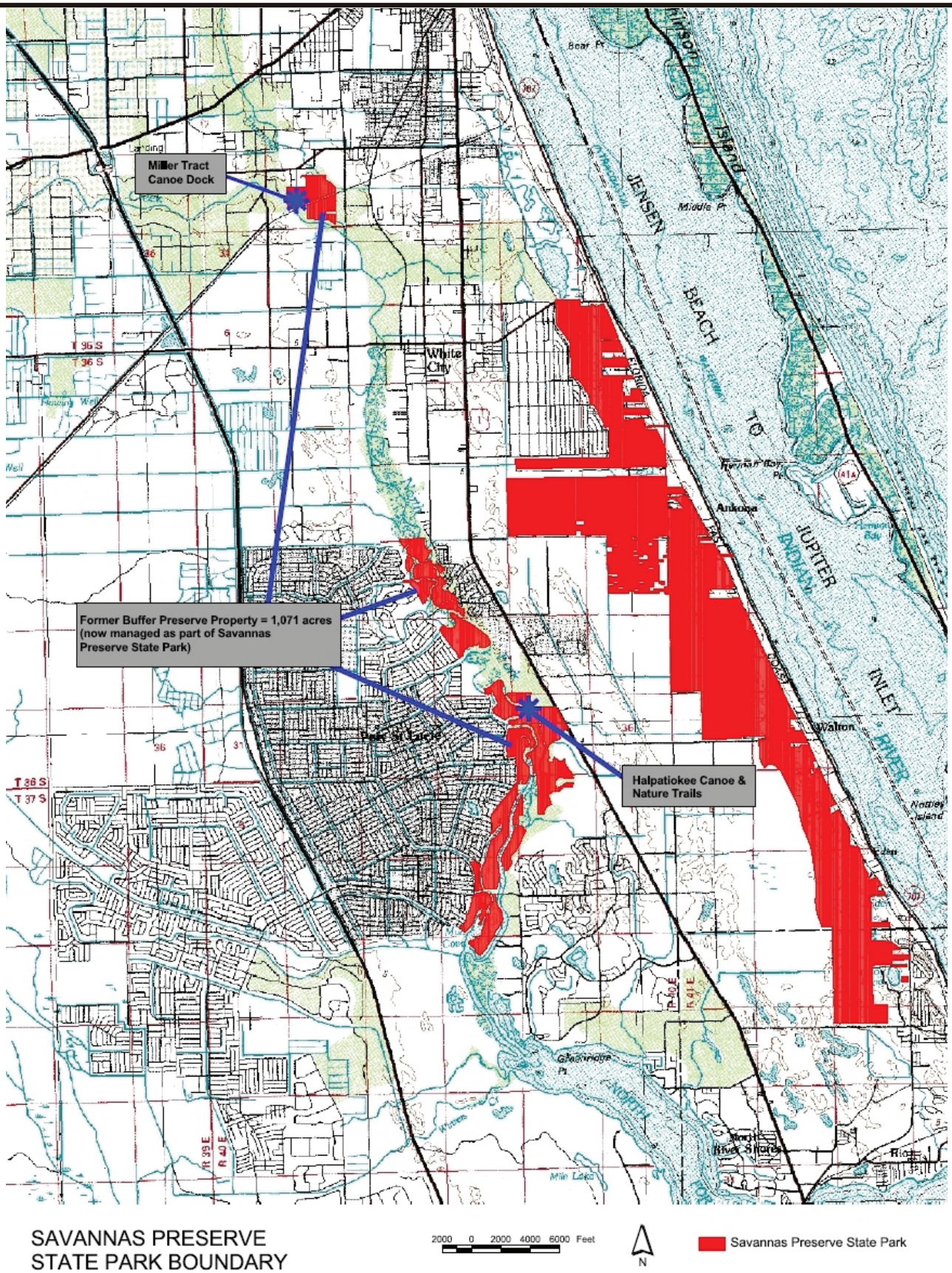
The Savannas Preserve State Park (SPSP) is composed of three separate pieces of land: the original SPSP located east of U.S. 1; the former NFSLR Buffer Preserve, located west of U.S. 1; and the Miller Tract, located west of Fort Pierce (**Figure 6.3**). The original SPSP is located along the Florida East Coast Railway between CR 712 in White City and Northeast Jensen Beach Boulevard in Jensen Beach (east of the project area). The portion west of U.S. 1 (western tracts of the SPSP) was originally known as the North Fork St. Lucie River State Buffer Preserve. It was managed by Coastal and Aquatic Managed Areas (CAMA) until December 2003 when these lands were transferred to the FDEP's Division of Recreation and Parks (along with other buffer preserve tracts across the state). Subsequently, the buffer preserve tracts were incorporated into the existing SPSP management unit. Today, both areas east and west of U.S. 1 are known as the SPSP. The western tracts of the SPSP (former NFSLR Buffer Preserve) are owned by the TIITF and by the SFWMD. The former NFSLR Buffer Preserve was first listed as a Conservation and Recreation Lands (CARL) project in 1988, but most of the lands were purchased with state funds from the Preservation 2000 Bond Trust Fund on December 28, 1994 (no federal funds were used to purchase these lands). The Miller Tract is located west of Fort Pierce and southeast of the I-95 and SR 70 interchange. It is situated north of the project study area at the confluence of Ten Mile Creek and Five Mile Creek.

In total, the SPSP encompasses 7,186 acres. Only the former NFSLR Buffer Preserve is located within the project area; the original SPSP and the Miller Tract are located outside the project area. According to FDEP, the portion of the SPSP located within the project study limits, between Prima Vista and Port St. Lucie Boulevards, is approximately 791 acres (letter from FDEP, dated August 7, 2007: **Appendix A**).

In its August 7, 2007 letter, the FDEP issued a statement of significance regarding the SPSP and indicated that all lands within the boundaries of the SPSP are managed for public outdoor recreation. The access point to the SPSP lands within the project area is the Halpatiokee Canoe and Nature Trail (**Photos 6.1 and 6.4**). Halpatiokee is contained within the SPSP; it is not a separate property. It has a shell rock driveway and parking lot for nine vehicles, contains a 15-foot wide firebreak, and provides a nature trail and a canoe/kayak stopover. As discussed for the AP [Section 6.1.1 (North Fork St. Lucie River Aquatic Preserve)], the trails through Halpatiokee are often inundated/flooded for most of the year. A boardwalk

Photo 6.4 Parking lot and trail head at Halpatiokee Canoe and Nature Trail

[10] Meeting minutes between the City and FDEP, August 17, 2010 and October 5, 2010 (**Appendix I**). This agreement is also contained in the Memorandum of Understanding between the City and FDEP (**Appendix L**).



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Savannas Preserve State Park

Figure 6.3

(approximately 50 feet long) is provided over the wettest part of the trail. As part of the coordination for the compensatory mitigation plan, the FDEP participated in the development of the concept plans to relocate Halpatiokee to the south. Halpatiokee would be relocated and improved under any of the build alternatives, including the Preferred Alternative (1C) [Section 6.7 (Compensatory Mitigation for Section 4(f) Uses)]. As with the access point to the AP, the 1,600-foot nature trail is relatively inaccessible and Halpatiokee does not need to remain in its current location. The Preferred Alternative will displace Halpatiokee at its current location and the facility will be replaced by the relocated facility 1,000 feet to the south. If any of the other build alternatives had been selected, the trail would have remained at its current location but the existing facility would be abandoned. The trail head information and kiosk would be removed and the access point and trails would be used only for park management activities (invasive plant species treatment and fire management). It would be gated to prevent access by the public.[11]

Currently, Halpatiokee is used for public recreation, educational outings, and nature appreciation. According to FDEP, there have been no visitation numbers collected for the Halpatiokee trailhead area. However, FDEP staff has provided an estimate of 1,000 visitors per year based on observations of site use patterns (this estimate also includes visitors to the AP who use Halpatiokee). No other public facilities are available within the portion of the SPSP located within the project area (west of U.S. 1). Access to other parts of the SPSP adjacent to the NFSLR is by boat only; no other maintained trails are provided elsewhere in this portion of the park (west of U.S. 1).

A management plan for the SPSP was completed in June 2003. However, this plan pertains only to those lands east of U.S. 1, outside the project area. The lands within the project area were not included in the 2003 management plan because they were not under the management authority of the Division of Recreation and Parks at the time. Management of the former NFSLR Buffer Preserve will be addressed in the next update of the SPSP management plan, scheduled in 2013.[12]

6.1.3 Kiwanis Park

The Kiwanis Park is a neighborhood park located west of Floresta Drive (**Figure 6.1**). Although the Park is sponsored by the Kiwanis Club and the Club has donated playground equipment, the park is owned and maintained by the City. It is approximately 3.8 acres in size and serves the passive and active recreational needs of the surrounding community. The facilities at the Park include playground equipment, a picnic area, a parking lot, a restroom, benches, and an open space playfield. The Park has maintained lawns with mature pines and other tree species. Specific information regarding the number of users of the Park has not been recorded. Access to the Park is by a driveway entrance on the southern side of the Park (Breakwater Avenue). It can also be accessed by foot or bicycle from the surrounding streets.

6.2 Evaluation of Avoidance Alternatives

The need for the project was first identified in 1980. Since that time, a number of corridors and alternatives have been examined in planning and engineering studies [Section 3.1 (Project History)]. It was recognized that the AP and SPSP are immediately adjacent to and intertwined with each other throughout most of the study area, except near the northern end of the study area where the SPSP ends. These earlier studies attempted to avoid both of these potential Section 4(f) properties (Section 4(f) determinations had not yet

[11] Meeting minutes with FDEP staff, dated July 10, 2012 (**Appendix I**) and Record of Telephone Conversation, Paul Rice, FDEP, October 6, 2010; **Appendix I**

[12] Letter from FDEP, dated August 7, 2007 (**Appendix A**).

been made). This section summarizes the various studies and alternatives that have been examined to avoid using lands from the three Section 4(f) properties. Details of the analyses can be found in Section 3.0 (Alternatives Including Proposed Action) and in the respective technical support documents.

The analysis of corridors and alternatives within the preferred corridor were documented in: *Analysis of Potential River Crossing Corridors (to Reduce Traffic Congestion in the City of Port St. Lucie) - Corridor Report Part I of II* - June 2008 (*Corridor Report)* and the *Crosstown Parkway Extension Alternatives Report – Corridor Report Part II of II* – June 2008 (*Alternatives Report*). These reports were reviewed by the Environmental Technical Advisory Team (ETAT). The ETAT includes the cooperating agencies [USFWS, USEPA, USACE, NMFS, and the U.S. Coast Guard (USCG)], and state and municipal agencies[13]. The ETAT conducts its review via the Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) public access website[14]. The analyses and results embodied in the reports were developed and reviewed with these agencies and the public through a series of coordination meetings [Technical Advisory Committee (TAC), Environmental Advisory Committee (EAC), and a Citizens Discussion Group (CDG)] documented in Section 8.0 (Comments and Coordination) of the EIS.

6.2.1 Corridor Alternatives

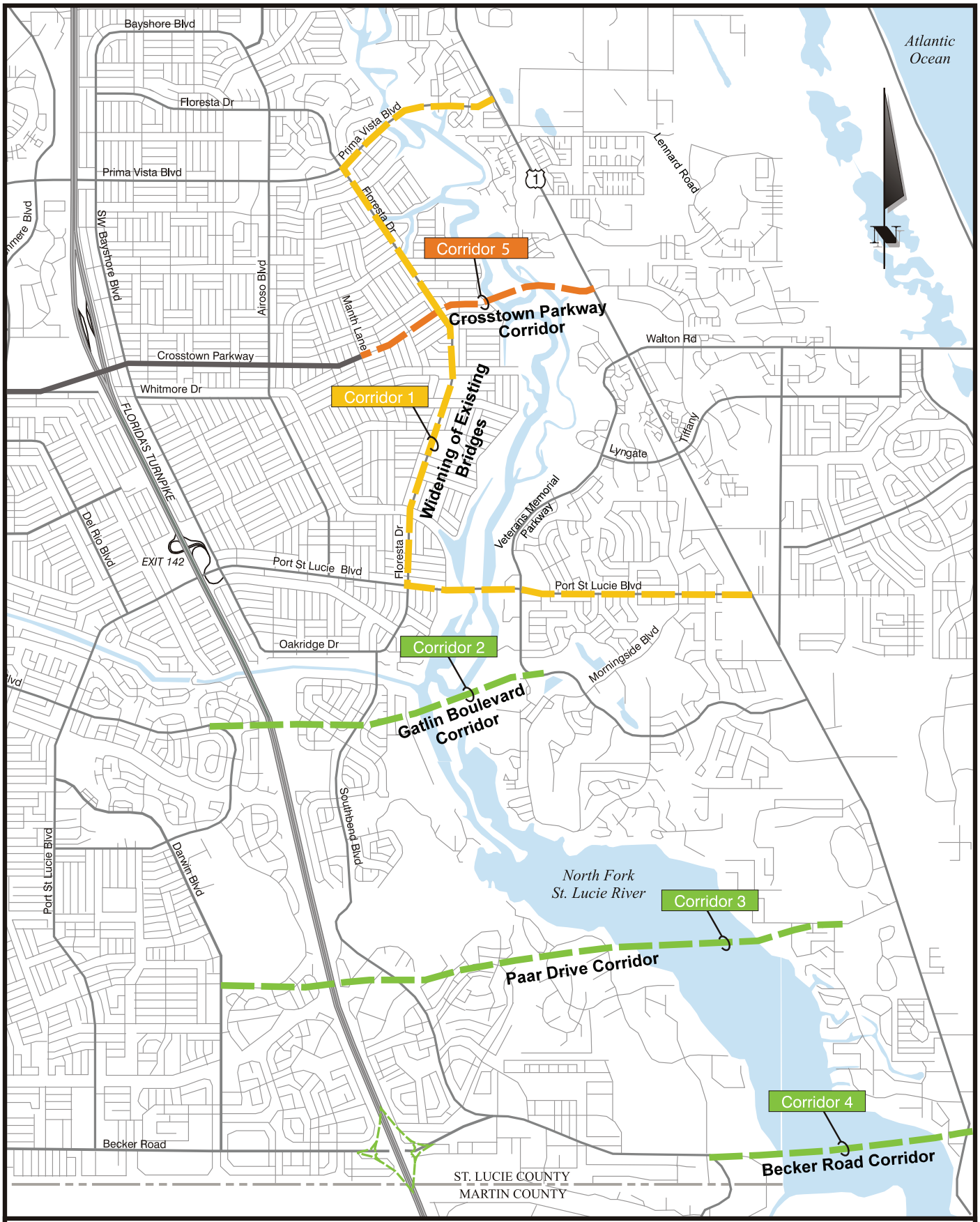
The *Corridor Report* examined the No Build Alternative and five corridors to cross the NFSLR (**Figure 6.4**). All corridors would cross the AP and all but the southernmost corridors (Corridors 3 and 4) would cross at least some portion of the SPSP. Under the No Build Alternative, no changes would be made to the existing bridge crossings, no new bridge would be constructed, and this corridor alternative would avoid the use of Section 4(f) resources. However, as discussed in Section 3.0 (Alternatives Including Proposed Action), the analysis in the *Corridor Report* indicated that the No Build Alternative did not meet the purpose and need for the project and thus, is not a prudent option. Further, as documented in the *Corridor Report*, the high degree of projected traffic (year 2025 forecasted traffic projections) would not be alleviated by improvements to the existing bridges. Even if both existing bridges at Prima Vista Boulevard and Port St. Lucie Boulevard were widened (Corridor 1), the demand would still far exceed (by nearly 25%) the capacity of the roadway network to cross the NFSLR. Once the need for the project was documented, the corridors were evaluated to identify alternatives that addressed the project purpose and need. Based on the analysis, it was concluded, with agreement from the advisory groups and coordination with FHWA, that Corridor 5 (Crosstown Parkway Corridor), was the only location for a crossing that met the purpose and need for the project and thus, is a prudent option. Comments were requested from the ETAT on June 19, 2008.[15] No comments on the published reports were made by the ETAT[16] and the reports were accepted by FHWA on March 24, 2009. The *Corridor Report* demonstrated that the corridors south of Port St. Lucie Boulevard (Corridors 2, 3, and 4) were effective in attracting forecasted traffic demand generated in the southern part of the corridor study area. However, none of those corridors provided relief to both of the existing crossings at Port St. Lucie Boulevard and Prima Vista Boulevard. Thus, these corridors are rejected as imprudent options.

[13] The state and municipal agencies include SFWMD, FDEP, FWC, Florida Department of Community Affairs (now called the Florida Department of Economic Opportunity), the Florida Department of State, the Miccosukee Tribe, and the St. Lucie Transportation Planning Organization.

[14] The *Corridor Report* and the *Alternatives Report* are available on the ETDM website: http://etdmpub.fla-etat.org/est (search Project #8247 under Project Attachments listed under the Project Information tab, Description sub-tab).

[15] Meeting minutes Crosstown Parkway Extension EIS Monthly Team Meeting, dated June 19, 2008 (**Appendix I**).

[16] Meeting minutes Crosstown Parkway Extension EIS Monthly Team Meeting, dated October 16, 2008 and November 20, 2008 (**Appendix I**).



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Corridors Evaluated - Corridor Report

(June 2008)
Figure 6.4

6.2.2 Alternatives within the Preferred Corridor

Once the preferred corridor was selected [Corridor 5 (Crosstown Parkway Corridor)], a number of alternatives were examined for their effectiveness at meeting the project purpose and need. This effort is described in the *Alternatives Report*. The *Alternatives Report* examined a No Build Alternative, a transportation system management alternative, a multimodal alternative, and a two-level screening process that examined eight potential build alternatives within the Crosstown Parkway Corridor (**Figure 6.5**). This process was discussed in Section 3.2.2 (Initial Alternatives Development). Alternatives were reviewed by the advisory committees and an additional group was formed during this time, the Environmental Advisory Committee – Core Group (EAC-CG). The EAC-CG was comprised of representatives from the federal and state regulatory agencies[17] to discuss regulatory and permitting issues as well as methods to avoid and minimize impacts as alternatives were being developed.

The *Alternatives Report* Level I screening evaluated eight build alternatives. Based on the Level 1 analysis conducted, it appeared that the Multimodal Alternative, the Transportation System Management (TSM) Alternative, and Alternatives 3 and 4 should be eliminated from further consideration because they did not meet the project purpose and need. This information was presented to the TAC and EAC, and ultimately the cooperating agencies, who concurred with eliminating these alternatives at a project scoping meeting held January 29, 2004[18]. Section 3.2.2.3.3 [Bridge Alternatives – Level 1 Screening (*Alternatives Report*)] summarizes the evaluation process used to eliminate these alternatives.

The *Alternatives Report* Level 2 screening evaluated the remaining six build alternatives (the same six alternatives that are evaluated for this EIS). The Level 2 screening criteria were developed to ensure that agencies and public issues were considered fully and to focus more definitively on performance in terms of traffic capacity and traffic relief to the bridges at Prima Vista Boulevard and Port St. Lucie Boulevard. The screening examined natural resource impacts, social impacts, community impacts, potential Section 4(f) use, and included an evaluation as to how well the alternatives met the project purpose and need. The results of the Level 2 Screening indicated that the six alternatives varied in their effectiveness in terms of meeting the project purpose and need and the other evaluation criteria. The FHWA determined that, due to the sensitive social and environmental character of the project area and to ensure a comprehensive comparison and evaluation of alternatives, all six alternatives would be carried forward as potential viable alternatives in the DEIS.[19]

Based on the analyses in the *Corridor Report* and the *Alternatives Report*, to meet the project purpose and need, it is necessary to provide an additional crossing of the NFSLR. Further, to meet the project purpose and need, the additional crossing needs to be within the Crosstown Parkway Corridor.

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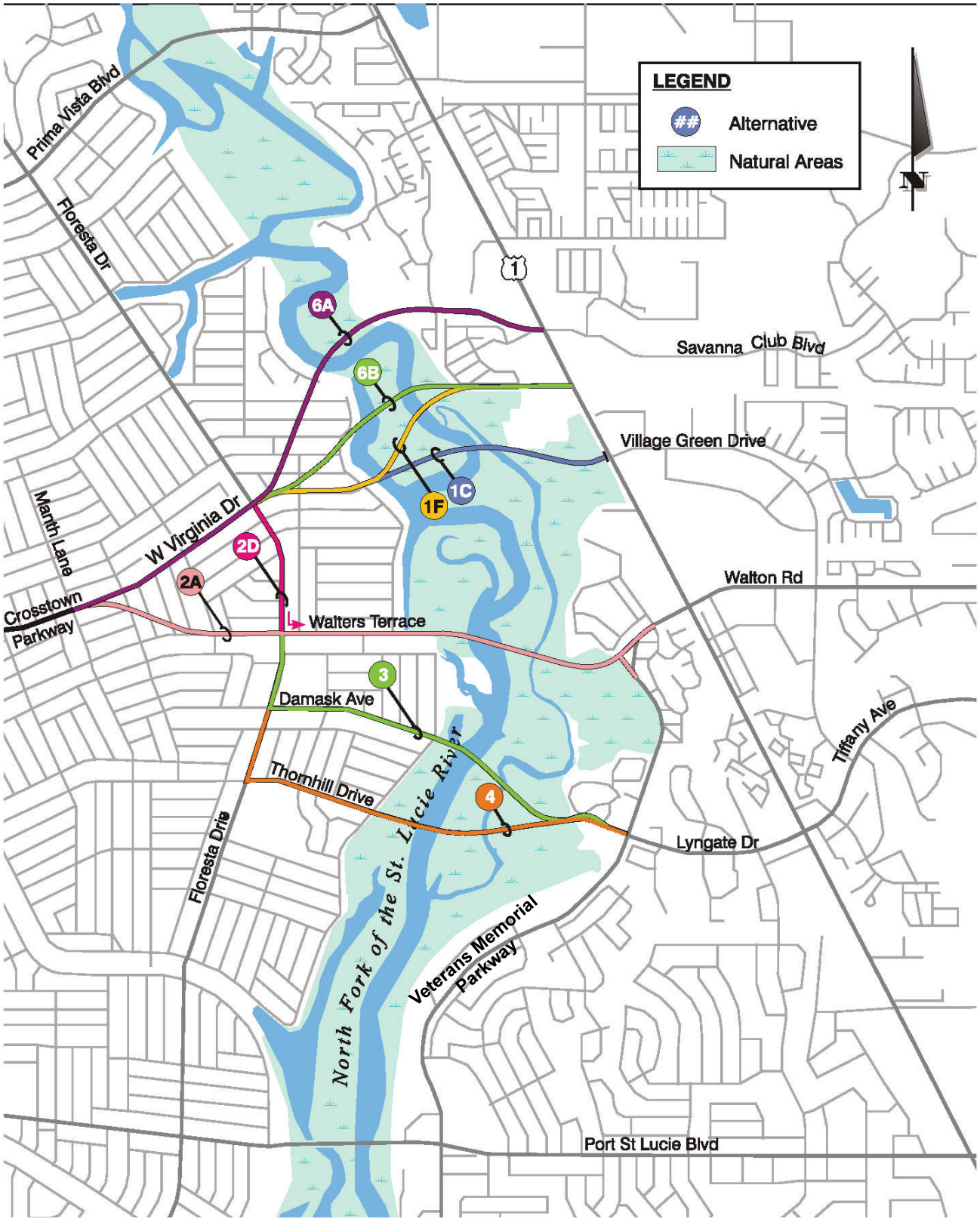
[17] The federal and state regulatory agencies included the USACE, SFWMD, and FDEP (Department of State Lands, Department of Resource Protection, Division of Recreation and Parks, and Coastal and Aquatic Management Areas).

[18] The official Project Scoping Meeting was subsequently conducted on September 18, 2008 [Section 8.0 (Comments and Coordination)].

[19] FHWA letter to James A. Wolfe, P.E., FDOT District 4, dated December 10, 2007 (**Appendix A**).



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Project Alternatives - Alternatives Report
(June 2008)
Figure 6.5

6.2.3 Evaluation of Avoidance Alternatives for Savannas Preserve State Park

A variety of alternatives was evaluated to avoid a use of the SPSP and these alternatives are summarized in **Table 6.2**. These alternatives are fully described in Section 3.0 (Alternatives Including Proposed Action), and the prudence test is fully discussed in Section 6.6 (Evaluation of Alternatives). The No Build Alternative, the Multimodal Alternative, the TSM Alternative, variations of the No Build Alternative, and several bridging options among the six build alternatives were evaluated as potential avoidance alternatives. Due to the proximity of the SPSP and the AP to each other, many of these alternatives are also potential avoidance alternatives for each other and are discussed here, where appropriate, for completeness.

6.2.3.1 Evaluation of Alternatives to Avoid a New Crossing of the NFSLR

Although multimodal programs and operations management could alleviate some congestion and operations problems, they would not address the capacity deficiencies throughout the roadway network. The Multimodal Alternative and the TSM Alternative are eliminated as imprudent because they do not meet the project purpose and need. The evaluation process is discussed in Section 3.2.3.2 (Multimodal Alternative) and Section 3.2.3.3 (TSM Alternative).

Grade-separated flyover ramps at U.S. 1 and Port St. Lucie Boulevard were evaluated and eliminated as imprudent because this alternative does not meet the project purpose and need. The ramps would only address intersection level of service at this one location and would not address the capacity deficiencies of the existing roadway network. Widening of the existing bridges was considered at three different times during the development of the six build alternatives.[20] Under each analysis, including the *Design Traffic Technical Memorandum* (DTTM), this alternative was eliminated as imprudent because it does not meet the project purpose and need. Even with widening, both bridges would continue to operate beyond the projected traffic carrying capacity. Widening of the bridges would also impact the SPSP and the AP because additional bridge piers would be required. In addition, widening of the existing bridges would require the acquisition of approximately 250 businesses that would result in substantial socioeconomic impacts. During the review of the DEIS, the NMFS suggested the examination of an additional alternative that would combine the widening of the existing bridges (at Port St. Lucie Boulevard and Prima Vista Boulevard) with the multimodal and TSM[21] alternatives. A two-tier analysis was performed that examined widening Prima Vista Boulevard and Port St. Lucie Boulevard to eight and ten lanes, respectively, in combination with a multimodal transportation and the TSM alternative. The analysis showed that, even with these improvements, the Port St. Lucie Boulevard Bridge would still be over capacity. In addition, widening of the bridges would result in the same socioeconomic and environmental impacts discussed above. Thus, this is not an avoidance alternative since it would use the SPSP (and the AP) because additional bridge piers would be required. In addition, widening of the bridges was eliminated as an avoidance alternative because it does not meet the project purpose and need.

[20] The widening of the existing bridges was considered during the *Corridor Report*, the *Alternatives Report*, and the DTTM prepared for this EIS.

[21] Transportation System Management (TSM) refers to the use of operational techniques and intersection improvements.

Table 6.2 Evaluation of Potential Avoidance Alternatives for the Savannas Preserve State Park[1]

Alternative	Summary of Evaluation
Evaluation of Alternatives to Avoid a New Crossing of the NFSLR	
No Build	Feasible but results in substantial intersection and arterial deficiencies throughout roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Multimodal Alternative	Feasible but does not address the capacity deficiencies throughout the roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Transportation System Management Alternative	Feasible but does not address the capacity deficiencies throughout the roadway network; eliminated as imprudent because it does not meet project purpose and need.
Grade-separated flyover ramps at U.S. 1 and Port St. Lucie Boulevard	Feasible but addresses intersection level of service only at this location and does not address the capacity deficiencies of the existing roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Widening existing bridges	Feasible but even with widening, both bridges would continue to operate beyond the projected traffic carrying capacity; widened bridges would use the AP and the SPSP because additional piers would be required; would result in the relocation of over 250 businesses along Port St. Lucie and Prima Vista Boulevards; eliminated as imprudent because it does not meet the project purpose and need and because of the additional socioeconomic impacts.
Widening existing bridges plus TSM and Multimodal alternatives	Feasible but even with combined alternatives, the Port St. Lucie Boulevard Bridge would still be over capacity; widened bridges would use the AP and the SPSP; would result in the relocation of over 250 businesses along Port St. Lucie and Prima Vista Boulevards; eliminated as imprudent because it does not meet the project purpose and need and because of the additional socioeconomic impacts.
Double-deck existing bridges	Has substantial engineering and structural constraints; would not avoid use of the AP (and SPSP); substantial community impacts at the termini where the elevated sections return to grade, especially at U.S.1. Eliminated as not prudent.
Evaluation of Alternatives to Completely Span the SPSP	
Tunnel along alignment of Alternative 1C	Feasible, but eliminated as imprudent; avoids use of the SPSP if the tunnel comes to grade 1,600 feet to the east of U.S. 1, which would require a new connection to U.S. 1; new connections would require substantial parcel acquisitions; more right of way required for tunnel; reduced flexibility for hurricane evacuation due to tunnel flooding concerns; limited bicycle and pedestrian usage; intrusive construction techniques may be required (soil stabilization); could have unanticipated construction impacts; substantially higher cost than a bridge.
Tunnel along alignment of Alternative 1F	Feasible but eliminated as imprudent; avoids use of the SPSP if alignment is shifted north; shift would require 17-18 additional residential relocations; wider right of way required for tunnel; reduced flexibility for hurricane evacuation due to tunnel flooding concerns; limited bicycle and pedestrian usage; intrusive construction techniques may be required (soil stabilization); could have unanticipated construction impacts; substantially higher cost than a bridge.
Cable-stayed bridge	Feasible but not an avoidance alternative for Alternatives 2A, 2D, 1C, 1F and 6B; at least one support structure is required within the SPSP (Alternative 6A is located outside the SPSP); would also cause substantial visual impacts in residential setting; could not be used in high wind conditions; substantially higher cost than other bridge types.

Table 6.2 Evaluation of Potential Avoidance Alternatives for the Savannas Preserve State Park (continued)

Alternative	Summary of Evaluation
Evaluation of Alternatives to Avoid the Use of the SPSP	
Alternatives 2A, 2D, 1C, 1F, and 6B	Feasible but piers are required within the SPSP; these alternatives do not avoid the use of the SPSP and are therefore not considered avoidance alternatives; Additionally, Alternatives 2D, 1F, and 6B result in severe impacts to established communities.
Alternative 6A	Feasible; avoids use of SPSP. However, not an avoidance alternative since it impacts another Section 4(f) property. This alternative has severe impacts to communities on both sides of the NFSLR.

[1] Section 3.0 (Alternatives Including Proposed Action) contains a full description and evaluation of alternatives.

Another alternative considered to avoid the SPSP was to double-deck the existing bridges. The substructure elements would need to be completely reconstructed and would need to be larger to meet the increased weight and load requirements, and because of the larger area exposed to high (hurricane) winds. This alternative would have substantial community impacts at the termini where the elevated sections return to grade, especially at U.S.1. This option has substantial engineering and structural constraints. In addition, it was eliminated as an avoidance alternative because it would increase the use of the SPSP (and the AP) to accommodate the reconstructed substructure and, therefore, would not avoid the 4(f) property.

Based on these analyses, there are no feasible and prudent alternatives that meet the project purpose and need and that avoid the construction of a new crossing of the SPSP.

6.2.3.2 Evaluation of Alternatives to Completely Span the SPSP

Two alternatives were evaluated to assess whether the SPSP could be completely spanned (crossed over without encroaching). These alternatives are summarized in **Table 6.2**.

6.2.3.2.1 Tunnel Alternatives

The USACE, USFWS, and NMFS recommended that a tunnel alternative be considered to avoid the use of the SPSP (and the AP). An alternative was examined to build a tunnel under the SPSP (and the AP). Any alignment within the project area could have been examined, but a straight alignment under the NFSLR was considered to be the most feasible in terms of engineering constraints and cost. Thus, a straight tunnel along the approximate alignment of Alternative 1C was chosen for the evaluation rather than the curved and less direct alignments of the other build alternatives. The analysis was documented in a *Tunnel Concept Report* (**Appendix G**), which concluded it is feasible to construct a tunnel along the alignment of Alternative 1C to completely avoid using the SPSP, but this alternative is not prudent because:

- It would encroach on the neighborhoods at the western terminus;
- To avoid the use of the SPSP, the tunnel would need to come to grade approximately 1,600 feet east of U.S. 1. This would require an alternative connection to U.S. 1 either through a new connection northward to Savanna Club Boulevard, through an improved (widened) Village Green Drive to connect with Walton Road, or through an eastward realignment (shift) of U.S. 1. These connection would require substantial parcel acquisitions;
- A larger amount of right of way (wider) for the tunnel would be required, especially at the western terminus, resulting in additional relocations (compared to the other build alternatives);

- A tunnel would have reduced flexibility during emergency hurricane evacuations due to possible flooding of the tunnel;
- A tunnel may have limited pedestrian and bicycle usage;
- Based on preliminary soil testing, soil conditions would likely require soil stabilization to construct the tunnel. This would require pressure grouting, which would require ground-based equipment in the SPSP and dredging in the AP;
- All tunnel construction has the potential for unanticipated construction impacts such as heave, settlement, and impacts on groundwater and wells; and
- The cost of a tunnel was estimated to be seven to eight times more than a bridge as discussed in Section 3.2.3.6.7 [Cost (Tunnel)].

During the review of the DEIS, the USACE suggested the tunnel alternative be reconsidered with an alignment along Alternative 1F or 6B because the eastern terminus could come to grade within upland habitat (to avoid wetland impacts). Alternatives 1F and 6B would have the same alignment on the eastern side of the NFSLR but Alternative 1F was chosen for this analysis because it would have fewer social impacts on the west side of the NFSLR. Based on this analysis, it was concluded that construction of a tunnel along the alignment of Alternative 1F is feasible. However, this alternative is not prudent because:

- It would encroach on the neighborhoods at the western and eastern termini because a tunnel would have a wider typical section than a roadway;
- It could be constructed to avoid the use of the SPSP (this portion of the SPSP contains uplands and wetlands), although the tunnel alignment would need to be shifted north. This would require the relocation of 17 to 18 additional residential relocations in the La Buona Vita community compared to a bridge along the same alignment (21 relocations are required for a bridge for Alternative 1F so a total of 38-39 relocations would be required for a tunnel option along the alignment of Alternative 1F). This number of relocations would result in a substantial economic impact to the cooperative community[22]; and
- It would have the same increased right of way requirements, need for soil stabilization, unanticipated construction impacts, reduced flexibility during emergency evacuation events, limited pedestrian and bicycle usage, and increased costs as described for the tunnel alternative along Alternative 1C.

Based on this evaluation, it is feasible to construct a tunnel to completely span the SPSP (and the AP), although both tunnel options would have substantial social impacts and considerable costs. Because of these impacts, the tunnel alternatives were eliminated as imprudent.

6.2.3.2.2 Cable-stayed Bridge Alternative

A cable-stayed bridge (suggested by the USACE) was another option to completely span the SPSP[23] (and the AP). This bridging option is not considered for Alternative 6A because it is located outside the SPSP. For the other build alternatives, this type of bridge construction is feasible, but in this case, a cable-stayed bridge is not an avoidance alternative. Cable-stayed construction is typically effective for spans[24] between

[22] La Buona Vita is a cooperative community made up exclusively of a population older than 55 years. Costs to operate and maintain the cooperative are divided among lot owners within the community. If residents are removed, the monthly costs will increase for the remaining owners.

[23] The tunnel and cable-stayed bridge alternatives were recommended by the USACE as avoidance alternatives for wetlands and aquatic habitats, not necessarily for Section 4(f) properties.

[24] In this context span refers to the distance between successive support structures.

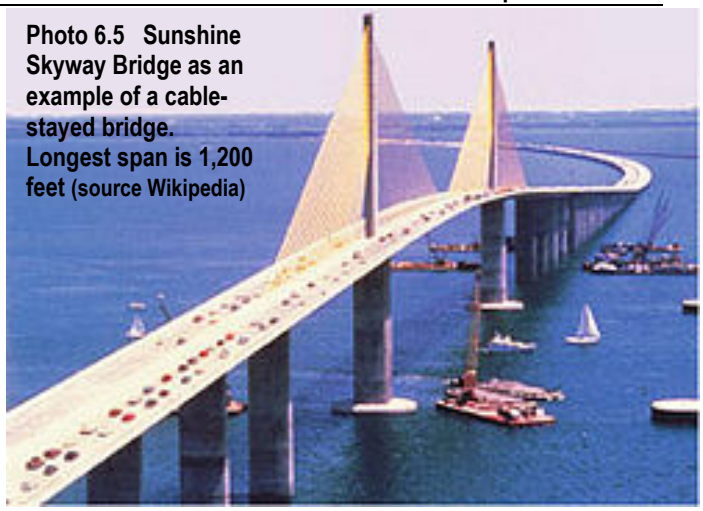

Photo 6.5 Sunshine Skyway Bridge as an example of a cable-stayed bridge. Longest span is 1,200 feet (source Wikipedia)

300 and 2,000 feet (**Photo 6.5**). The bridge lengths for the Crosstown Parkway Extension [to completely span the SPSP (and the AP)] range from 2,300 feet to 4,000 feet. Thus, at least one support structure would be placed within the SPSP. In addition:

- Cable-stayed construction would utilize tower structures of a considerable height to support the forces required. The height of the towers and the visual scale of this type of bridge would be out of keeping with the residential and low-rise characteristics of the project area. Visual impacts of the towers would also be substantial within the natural setting of the SPSP and the AP.
- Cable-stayed bridges, designed to be flexible, do not perform well under high wind conditions, and are usually closed during certain high wind conditions. This could compromise the crossing as a hurricane evacuation route during high wind conditions.
- The use of steel cable may add an additional maintenance requirement in the corrosive marine environment, which could have negative impacts on the habitats of the SPSP and the water quality of the AP [as Outstanding Florida Waters (OFW)].
- The estimated cost for a cable-stayed bridge would be 2.5 to 3 times the estimated cost for a pier-supported bridge.

Based on this evaluation, a cable-stayed bridge is feasible but is not an avoidance alternative for the SPSP for Alternatives 2A/2D, 1C, 1F, and 6B because at least one support structure is required within the SPSP (6A is located outside the SPSP) and due to the substantial additional impacts mentioned above. However, a cable-stayed bridge is evaluated as a minimization measure in Section 6.3.2 (Measures to Minimize Harm for Specific Build Alternatives).

6.2.3.2.3 Build Alternatives

Although feasible, all of the build alternatives except for Alternative 6A would impact the SPSP and, therefore, are not avoidance alternatives. Alternative 6A avoids the use of the SPSP because it is located north of the SPSP boundaries. However, Alternative 6A would have severe social impacts on both sides of the NFSLR and since it would impact another Section 4(f) property (the AP), it cannot be considered an avoidance alternative.

6.2.3.3 Summary of the Evaluation of Alternatives to Avoid Use of the SPSP

No feasible and prudent avoidance alternatives exist to avoid the SPSP (and the AP). The two tunnel alternatives are feasible but are eliminated as imprudent. A cable-stayed bridge is feasible but it is not a prudent avoidance alternative for Alternatives 2A, 2D, 1C, 1F, and 6B because at least one support structure would be required within the SPSP (Alternative 6A is located outside the boundaries of the SPSP). In addition, a cable-stayed bridge results in severe social and economic impacts when used for Alternatives 2D, 1F and 6B. While Alternative 6A avoids the SPSP, it would have severe social impacts on

both sides of the NFSLR and would impact another Section 4(f) property precluding its consideration as an avoidance alternative. The bridging option with a pile bent substructure [see Section 6.2.4.2.8 (Pile Bent Substructure)] is the most viable and least harmful option for crossing the SPSP although this option will use lands from the SPSP.

6.2.4 Evaluation of Avoidance Alternatives for the North Fork St. Lucie River Aquatic Preserve

A variety of alternatives were evaluated as avoidance alternatives for the AP. These alternatives are summarized in **Table 6.3**. The No Build Alternative, the Multimodal Alternative, the TSM Alternative, variations of the No Build Alternative, and bridging options among the six build alternatives were evaluated. Many of these alternatives were also evaluated as avoidance alternatives for the SPSP.

6.2.4.1 Evaluation of Alternatives to Avoid a New Crossing of the NFSLR

Seven alternatives were examined to avoid a new crossing of the NFSLR, which are the same as those considered to avoid the SPSP [Section 6.2.3.1 (Evaluation of Alternatives to Avoid a New Crossing of the NFSLR)]. As described in Section 6.2.3 (Evaluation of Avoidance Alternatives for the Savannas Preserve State Park), the evaluation of multimodal programs and operations management showed that they could alleviate some congestion and operations problems, but they would not address the capacity deficiencies throughout the roadway network. Thus, the Multimodal Alternative and the TSM Alternative do not meet the project purpose and need and are eliminated as imprudent. The evaluation process is discussed in Section 3.2.3.2 (Multimodal Alternatives) and Section 3.2.3.3 (TSM Alternative). Also, as described in Section 6.2.3 (Avoidance Alternatives for the Savannas Preserve State Park), grade-separated flyover ramps at U.S. 1 and Port St. Lucie Boulevard and widening of the existing bridges do not meet the project purpose and need and are eliminated as imprudent. In addition, widening of the existing bridges would use the AP (and the SPSP) because additional bridge piers in the AP would be required. The alternative to double-deck the existing bridges is not prudent because of severe engineering and structural constraints [as described in Section 6.2.3.1 (Evaluation of Alternatives to Avoid a New Crossing of the NFSLR)] and substantial community impacts. In addition, this alternative is not an avoidance alternative because it would use the AP for the reconstructed substructure.

6.2.4.2 Evaluation of Alternatives to Span and Avoid Use of the AP

The construction method for all build alternatives, including the Preferred Alternative, includes a top down construction method or construction methods from temporary platform, trestles, or other similar methods to minimize harm. Bridging options to completely cross the AP to avoid the use of submerged lands in the AP were examined for all build alternatives.

6.2.4.2.1 Tunnel Alternatives

To completely cross the AP (and the SPSP), two tunnel alternatives were examined along the alignments of Alternative 1C and Alternative 1F that would build a pair of tunnels under the AP (and the SPSP). As discussed in Section 6.2.3 (Avoidance Alternatives for the Savannas Preserve State Park), one tunnel

Table 6.3 Evaluation of Potential Avoidance Alternatives for the North Fork St. Lucie River Aquatic Preserve [1]

Alternative	Summary of Evaluation
Evaluation of Alternatives to Avoid a New Crossing of the NFSLR	
No Build	Feasible but results in substantial intersection and arterial deficiencies throughout roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Multimodal Alternative	Feasible but does not address the capacity deficiencies throughout the roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Transportation System Management Alternative	Feasible but does not address the capacity deficiencies throughout the roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Grade-separated flyover ramps at U.S. 1 and Port St. Lucie Boulevard	Feasible but addresses intersection level of service only at this location and does not address the capacity deficiencies of the existing roadway network; eliminated as imprudent because it does not meet the project purpose and need.
Widening existing bridges	Feasible but even with widening, both bridges would continue to operate beyond the projected traffic carrying capacity; widened bridges would use the AP and the SPSP because additional piers would be required; would result in the relocation of over 250 businesses along Port St. Lucie and Prima Vista Boulevards; eliminated as imprudent because it does not meet the project purpose and need and because of the additional socioeconomic impacts.
Widening existing bridges plus TSM and Multimodal alternatives	Feasible but even with combined alternatives, the Port St. Lucie Boulevard Bridge would still be over capacity; widened bridges would use the AP and the SPSP; would result in the relocation of over 250 businesses along Port St. Lucie and Prima Vista Boulevards; eliminated as imprudent because it does not meet the project purpose and need and because of the additional socioeconomic impacts.
Double -deck existing bridges	Has substantial engineering and structural constraints; would not avoid use of the AP (and SPSP); substantial community impacts at the termini where the elevated sections return to grade, especially at U.S.1. Eliminated as not prudent.
Evaluation of Alternatives to Span and Avoid Use of the AP	
Tunnel along alignment of Alternative 1C	Feasible but eliminated as imprudent; avoids use of the AP but would require the use of approximately six acres of the SPSP at the eastern terminus; to avoid use of the SPSP, the tunnel would need to come to grade 1,600 feet to the east of U.S. 1, which would require a new connection to U.S. 1; new connections would require substantial parcel acquisitions; more right of way required for the tunnel compared to a bridge; reduced use for hurricane evacuation due to potential flooding; limited bicycle and pedestrian usage; intrusive construction techniques may be required (soil stabilization); could have unanticipated construction impacts; substantially higher cost than a bridge.

Table 6.3 Evaluation of Potential Avoidance Alternatives for the North Fork St. Lucie River Aquatic Preserve [1](continued)

Alternative	Summary of Evaluation
Tunnel along alignment of Alternative 1F	Feasible but eliminated as imprudent; avoids use of the AP but would require the use of the SPSP at the eastern terminus; to avoid impacts to the SPSP, the tunnel must be shifted north; the shift would result in 17 to 18 additional residential relocations in La Buona Vita; more right of way required for the tunnel compared to a bridge; reduced use for hurricane evacuation due to potential flooding; limited bicycle and pedestrian usage; intrusive construction techniques may be required (soil stabilization); could have unanticipated construction impacts; substantially higher cost than a bridge.
Cable-stayed bridge	Feasible but not an avoidance alternative for Alternatives 2A, 2D, 1C, 1F and 6B; at least one support structure is required within the SPSP (Alternative 6A is located outside the SPSP); eliminated as imprudent because of substantial visual impacts in residential setting; could not be used in high wind conditions; substantially higher cost than other bridge types.
Steel Beams	Feasible but eliminated as imprudent; requires regular maintenance in the corrosive marine environment which could affect the water quality of the AP (Outstanding Florida Waters) and wildlife habitats of the SPSP.
High Performance Steel	Feasible but eliminated as imprudent; could require additional maintenance (on a longer schedule than steel beams) in corrosive environment as compared to concrete structures; maintenance could affect water quality of the AP (Outstanding Florida Waters) and wildlife habitats of SPSP.
Evaluation of Prestressed Concrete Florida I-Beam Bridging Option	
Alternative 2A	Not feasible because width of the NFSLR exceeds maximum length of beam; would impact SPSP; not an avoidance alternative for the AP.
Alternative 2D	Not feasible because width of the NFSLR exceeds maximum length of beam; would impact SPSP; not an avoidance alternative for the AP.
Alternative 1C	Feasible at North Coral Reef Waterway and Evans Creek; potentially not an avoidance option for the NFSLR due to uncertainties regarding limiting design considerations; uncertain transportation requirements to transport beams to site; impacts the SPSP; not an avoidance alternative.
Alternative 1F	Not feasible because width of the NFSLR exceeds maximum length of beam; would impact SPSP; not an avoidance alternative for the AP.
Alternative 6B	Not feasible because width of the NFSLR exceeds maximum length of beam would impact SPSP; not an avoidance alternative for the AP.
Alternative 6A	Not feasible due to uncertainties regarding limiting design considerations; uncertain transportation requirements to transport beams to site; potentially not an avoidance alternative for the AP. Collective operational, visual, noise and severe community and cohesion impacts would make this an imprudent avoidance alternative even if design and construction issues were resolved.
Evaluation of Prestressed Post Tensioned (Spliced) Beam Bridging Option	
Alternative 2A	Not feasible because width of the NFSLR exceeds practical length of spliced beam spans; not an avoidance alternative for the AP.
Alternative 2D	Not feasible because width of the NFSLR exceeds practical length of spliced beam spans; not an avoidance alternative for the AP.
Alternative 1C	Feasible; AP can be spanned; NFSLR can be spanned with spliced beams (Evans Creek and North Coral Reef Waterway can be spanned with standard I-beams); larger support structure requirements increase the use of SPSP therefore this is not an avoidance alternative for the AP.

Table 6.3 Evaluation of Potential Avoidance Alternatives for the North Fork St. Lucie River Aquatic Preserve [1] (continued)

Alternative	Summary of Evaluation
Evaluation of Prestressed Post Tensioned (Spliced) Beam Bridging Option (continued)	
Alternative 1F	Feasible; AP can be avoided; the NFSLR can be spanned with spliced beams (North Coral Reef Waterway can be spanned with standard I-beams); larger support structure increases use of SPSP; not an avoidance alternative for the AP.
Alternative 6B	Feasible; but may use the AP; the NFSLR can be spanned with spliced beams; North Coral Reef Waterway width potentially exceeds the practical limits for spliced beam spans; larger support structure increases use of SPSP; not an avoidance alternative for the AP.
Alternative 6A	Feasible; AP can be avoided; larger support structures increases use of non-Section 4(f) resources (wetlands/essential fish habitat); collective operational, visual, noise and severe community and cohesion impacts; bridging option eliminated as imprudent because of increased non-Section 4(f) impacts.
Evaluation of Segmental Bridging Option	
All build alternatives	Feasible; eliminated as imprudent because not economically viable; based on industry standards, all bridge lengths are of insufficient length to be economically competitive with other bridge types.
Evaluation of Pile Bent Substructure Bridging Option	
All build alternatives	Feasible but involves a use of the AP; retained as the most viable and least harmful bridging option for all build alternatives, including Preferred Alternative; requires least harm analysis.

[1] Section 3.0 (Alternatives Including Proposed Action) contains a full description and evaluation of alternatives and crossing options.

alternative was evaluated approximately along the alignment of Alternative 1C to provide a straight alignment under the NFSLR (and SPSP). To transition the tunnel back to grade on the approach to an intersection at U.S. 1, the eastern terminus would require the use of approximately six acres of the SPSP (another Section 4(f) property). This amount of use in the SPSP is greater than the 1.74 acres of use (for the eastern bridge approach of the Preferred Alternative). Alternatively, to avoid the use of the SPSP, as discussed in Section 6.2.3 (Avoidance Alternatives for the Savannas Preserve State Park), the tunnel would need to come to grade approximately 1,600 feet east of U.S. 1. This would require an alternative connection to U.S. 1 either through a new connection northward to Savanna Club Boulevard or through an improved (widened) Village Green Drive to connect with Walton Road. Either connection would require substantial parcel acquisitions.

As discussed in Section 6.2.3 (Avoidance Alternatives for the Savannas Preserve State Park), a second tunnel alternative along the alignment of Alternative 1F was examined. This tunnel option is feasible but would use approximately three acres of lands from the SPSP at the eastern terminus. To avoid the use of the SPSP, the alignment must be shifted to the north, which would require the relocation of 17 to 18 additional residential relocations in La Buona Vita community compared to a bridge along the same alignment (21 relocations are required for a bridge for Alternative 1F). Thus, to avoid the use of both Section 4(f) properties, a total of 38-39 relocations would be required for a tunnel option along the alignment of Alternative 1F.

Based on these analyses, it is feasible to construct a tunnel to completely cross the AP, although both tunnel options have substantial social impacts and considerable costs. For the same reasons as described in Section 6.2.3 (Avoidance Alternatives for the Savannas Preserve State Park), both tunnel alternatives are eliminated as imprudent.

6.2.4.2.2 Cable-stayed Bridge Alternative

An option was examined that would construct a cable-stayed bridge over the AP. To cross one or more areas of the AP, this type of bridge is feasible, in concept, but it is not prudent. For example, for spans less than 250 feet (**Table 6.4**; Alternatives 1C, 1F and 6A), a more economical bridging option would be preferred, such as a bridge constructed with spliced beams. For Alternatives 2A, 2D, and 6B, where spliced beams are not guaranteed avoidance alternatives, the cable-stayed bridging option is feasible, but would use lands in the adjacent SPSP. Further, as discussed in Section 6.2.3 (Evaluation of Avoidance Alternatives for the Savannas Preserve State Park), this bridge type is not prudent because of the substantial visual impacts created in a residential setting and the substantial social impacts associated with several alternatives (1F, 6B, and 6A). Additionally, there is the potential for increased maintenance requirements associated with the use of steel cables in a corrosive marine environment which could have negative impacts on the water quality of the AP [an Outstanding Florida Water (OFW)].

Table 6.4 Width of the AP (feet) at the Crossings of the Build Alternatives at Mean High Water[1]

Span	Alternative					
	2A	2D	1C	1F	6B	6A
North Coral Reef Waterway			140	140	295	
NFSLR	640	640	200	215	220	174
Evans Creek	65	65	176			
Unnamed Tributary						40

[1] AP widths (feet) based on field determinations conducted in June 2003.

6.2.4.2.3 Steel Beam Alternative

The option of constructing a bridge using steel beams was examined to completely avoid the use of the AP. Based on field determinations of the MHW (which determines the boundaries of the AP), the width of the AP ranges from approximately 40 to 640 feet (**Table 6.4**).

A bridge beam capable of spanning these widths is feasible but they would require regular maintenance to protect the steel within the corrosive marine environment. For these reasons, the design team was guided by the recommendations of the Technical and Environmental Advisory Groups and ETDM comments to avoid the use of steel. The avoidance and minimization of potential short-term (construction) and long-term (operation) impacts were identified as important factors. It was recognized that maintenance of steel, which can require scaffolding or ground-based equipment and equipment from barges, is potentially more intrusive than maintenance of concrete beams. Thus, in recognition of the location of the build alternatives in or near the SPSP and/or the AP (an OFW), the design team decided to focus on concrete technologies and bridge types to minimize the potential impacts from bridge maintenance activities. Based on these considerations, the use of steel beams is feasible but was eliminated as imprudent.

6.2.4.2.4 High Performance Steel Alternative

High Performance Steel (HPS) was recommended by the USACE (as a potential minimization technique) because it would reduce the maintenance required by extending the periods between maintenance activities. According to FHWA's guidance (High Performance Steel Designers' Guide, Second Edition, 2002, and the corresponding Technical Advisory 5140.22), HPS is a superior product that minimizes the need for maintenance (it is maintained as weathered steel). However, Section 2.5 of the Designer's Guide (Weathering Characteristic) states, "the designers should follow the same guidelines and detailing practice for conventional weathering grade steels to assure successful applications of HPS steels in the unpainted conditions." The Technical Advisory offers the following guidance:

> *If the proposed structure is to be located at a site with any of the characteristics noted in paragraph 3a [Marine Coastal Areas] or 3b [Frequent High Rainfall, High Humidity or Persistent Fog (Condensing Conditions)], the use of uncoated steel (AASHTO M270 Weathering Grade Steels) should be considered with caution and a study of both the macro-environment and micro-environment by a corrosion consultant may be required. In all environments, the designer must pay careful attention to detailing … and the owner should implement, as a minimum, the maintenance actions as noted in paragraph 3d […Periodically clean and, when needed, repaint all steel within a minimum distance of 1 1/2 times the depth of the girder from bridge joints].*

The maintenance cycle of HPS may be longer, but would not be eliminated. The use of HPS would require maintenance that, when conducted, could temporarily affect water quality of the AP (an OFW) and the aquatic and terrestrial habitats below the bridge. Even though maintenance techniques have been developed to limit the degradation of water quality, as an OFW, no degradation of water quality is permitted. Thus, the use of HPS is feasible but was eliminated as imprudent because of the potential, however slight, to affect the water quality of the AP (and the habitats of the SPSP).

6.2.4.2.5 Prestressed Concrete Florida I-Beam Alternative

Prestressed Concrete Florida I-Beams were investigated as a means to completely avoid the AP (and the SPSP). The feasibility of the use of this option varies by alternative. In the evaluation of this bridging option, the following factors were considered:

- As spans exceed 60 feet, Prestressed Concrete Florida I-Beams are routinely used. Beams of up to 208 feet are available. To fully eliminate a use of the AP for all build alternatives, beams longer than the span at that particular crossing would be needed (**Table 6.4**). Some spans exceed the length of the longest available beams.
- Contractors who are familiar with Prestressed Concrete Florida I-Beams were contacted to investigate the feasibility of using this bridge option for the project. This investigation demonstrated the uncertainty of this construction technique at this stage of project development. Based on contractor experience, beams of up to 200 feet in length would likely be delivered to the site by barge although substantial logistic challenges exist. Beams of this length require special transport vehicles with limited turning radii. In addition, beams of this size weigh more than 200,000 pounds, which would add to the complexity of transporting them to the site. Any beam over 140 feet requires special permits to allow for transport to the site. In addition, investigations would be required to determine if the NFSLR has adequate depths to transport beams of this length and weight to the site. Based on field observations, it would not be feasible to transport beams of this size and weight via Evans Creek.

The use of Prestressed Concrete Florida I-Beams is not feasible as an avoidance alternative for Alternatives 2A and 2D because the width of the AP at the crossing location (640 feet) exceeds the maximum length of a single beam, and would require the placement of piers within the AP. This option is not feasible for Alternative 1C because only two of this alternative's three crossings can be avoided. It is feasible to cross the North Coral Reef Waterway and Evans Creek, but it may not be feasible to cross the NFSLR, which has a width of 200 feet at this location (200 feet approaches the maximum beam length). Uncertainties would remain regarding limiting design considerations.[25] Thus, the possibility of the use of the AP cannot be eliminated for this alternative. Additionally, larger support structures will be necessary to support the longer beams which create additional impacts to adjacent habitats in the SPSP, eliminating this as a Section 4(f) property avoidance alternative. This option is not feasible for Alternative 1F because the width of the NFSLR (215 feet) at the crossing location exceeds the maximum length of beam, and would require the placement of a support structure within the AP. This option is not feasible for Alternative 6B because the width of the NFSLR (220 feet) at the crossing location exceeds the maximum length of beam, and would require the placement of a support structure within the AP. Finally, this option is potentially feasible for Alternative 6A because the width of the AP is 174 feet at the crossing location. However, the possibility of the use (encroachment) of the AP cannot be completely eliminated because of limiting design and construction considerations. Also, avoiding the AP with Alternative 6A is imprudent because it increases impacts to wetlands and essential fish habitat (non-Section 4(f) resources) in combination with severe social impacts on both sides of the NFSLR, as discussed in Section 6.6 (Evaluation of Alternatives). Based on the above, this bridging method was eliminated as a feasible and prudent avoidance alternative.

6.2.4.2.6 Prestressed Post Tensioned (Spliced) Beam Alternative

Prestressed Post Tensioned[26] (Spliced) Beams is a bridging option that allows for a longer span[27] than Prestressed Concrete Florida I-Beams. This type of construction uses multiple prestressed concrete beams connected together for spanning extra-long lengths. The maximum practical span limit is approximately 320 feet.

This bridging option is not feasible for Alternatives 2A and 2D, where the width of the NFSLR exceeds the span limits for spliced beams. This option is feasible for Alternatives 1C to cross the NFSLR and Evans Creek (the North Coral Reef Waterway can be spanned using standard Prestressed Concrete Florida I-Beams). This option is feasible for Alternative 1F to cross the NFSLR (the North Coral Reef Waterway can be spanned by using standard Prestressed Concrete Florida I-Beams). This option is feasible for Alternative 6B over the NFSLR, but may not be feasible over the North Coral Reef Waterway where the width of the waterway approaches the practical limits for spliced beams. This bridging option is therefore

[25] Limiting design considerations include unknown geotechnical and site specific conditions, such as unsuitable soils that would be unable to support the bridge. This type of information is needed to design the maximum length of beam that can be constructed. Other considerations include transportation requirements to transport beams to the site, especially for the shallow and narrow Evans Creek, although beams for an Evans Creek crossing could be transported to the site via the NFSLR main channel.

[26] Post tensioning is a technique used to reinforce concrete beams allowing them to carry a greater load or span a greater distance than standard reinforced concrete beams. During the casting of a post tensioned beam, lengths of steel wire or cables are laid in the empty mold and stretched after the concrete is cured. Prestressing places a concrete beam in compression, which counteract the tensile bending stresses of an applied load (McGraw-Hill Concise Encyclopedia of Engineering. 2002. McGraw-Hill Companies, Inc.).

[27] In this context span refers to the length between two successive piers.

eliminated as not feasible for Alternative 6B because avoidance of the AP at the crossing of North Coral Reef Waterway cannot be guaranteed. Alternative 6B would also have similar increased impacts to the SPSP as discussed below for Alternative 1F.

As discussed above, the use of the AP can be avoided by using a combination of spliced beams and Prestressed Concrete Florida I-Beams for Alternatives 1C, 1F, and 6A. However, for Alternatives 1C and 1F, using spliced beams/Florida I-beams to avoid a use of the AP would result in an increase in the use of Section 4(f) property in the SPSP to accommodate the larger substructure elements necessary to support the longer spans.[28] Compared to the support structures for the pile bent construction option, the amount of land used for spliced beam support structures would be 34 times greater for Alternative 1C, and 45 times greater for Alternative 1F (**Table 6.5**). This is because the footings required for a spliced beam support structure are 15 times greater (to support the additional loads) than a pile bent structure (964 ft^2 compared with 64 $ft^{2)}$.

It is important to note that for the Preferred Alternative to avoid the use of the AP (0.015 acres), a spliced beam construction method would increase the use of the SPSP by 0.50 acre. This is important because, the FDEP (the agency with jurisdiction) has expressed a preference for the placement of piers in the AP rather than have additional impacts to the SPSP, and the SFWMD has expressed a preference for piers in the AP over additional impacts to any adjacent wetlands.[29] Although the increased use is small in terms of acres, the spliced beam support structure would have increased effect on the particular habitat in which it is located. Because the avoidance of the AP would increase the use of the SPSP (also a Section 4(f) property), the spliced beam bridging option is eliminated as an avoidance option for Alternatives 1C and 1F. This bridging option is feasible for Alternative 6A to cross the NFSLR. However, this bridging option is not a prudent avoidance alternative for Alternative 6A since it would result in severe social impacts on both sides of the NFSLR. In addition, it should be noted that impacts to adjacent habitat of non-Section 4(f) resources would be 69 times greater for the spliced beam bridging option for Alternative 6A than for using a pile bent structure for Alternative 6A (**Table 6.5**).

6.2.4.2.7 Concrete Segmental Bridge Alternative

Segmental bridge construction is a specialized construction technique. Segmental bridges can span distances of 300 to 400 feet, depending on the superstructure depth and the construction method. Thus, it is possible to span the AP associated with the various build alternatives (**Table 6.4**) except for Alternatives 2A and 2D, which would require spans greater than 640 feet to avoid the AP. The cost of constructing a segmental bridge becomes competitive (in cost and construction time) with other bridging methods if the bridge involves longer span lengths and uses 600 to 700 segments (segment widths of 8 to 10 feet are typical and were used for this evaluation). Even if a bridge is constructed over the combined width of the AP and the SPSP, a segmental bridge is still too short to be economically competitive compared with other bridging techniques (the number of segments would range from 400 to 470). This bridging technique would

[28] Each footing for the support structure for the spliced beam construction technique is equivalent to 69 piles for the pile bent construction technique.

[29] Email record of telephone conversation, with Delbert Harvey, FDEP Community Program Manager, Division of State Lands, Bureau of Land Acquisition, dated May 15, 2012 and record of telephone conversation with Mindy Parrott, SFWMD, dated June 8, 2012 (**Appendix A**).

Table 6.5 Summary of the increased use of the adjacent habitat to avoid a use of the AP

Location	Habitat Affected (FLUCCS)	Pile Bent Construction (acres)	Spliced Beam Construction (acres)	Times Bigger than Pile Bent Construction
Alternative 1C				
West Bank North Coral Reef Waterway	Brazilian Pepper	0.0008	0.0127	15
West Bank North Coral Reef Waterway	Mangrove Swamps	0	0.0073	Undefined
East Bank North Coral Reef Waterway	Mangrove Swamps	0.0007	0.0421	57
East Bank North Coral Reef Waterway	Freshwater Marsh with Shrubs, Brush, and Vines	0.0007	0.0507	69
West Bank NFSLR	Stream and Lake Swamps	0.0028	0.1015	37
East Bank NFSLR	Live Oak	0.0028	0.1015	37
West Bank Evans Creek	Stream and Lake Swamps	0.0032	0.1015	32
East Bank Evans Creek	Mixed Wetland Hardwoods	0.0044	0.1015	23
Total		**0.0154**	**0.5188**	**34**
Alternative 1F				
West Bank North Coral Reef Waterway	Brazilian Pepper	0.0007	0.0507	69
East Bank North Coral Reef Waterway	Mangrove Swamps	0.0006	0	0
East Bank North Coral Reef Waterway	Stream and Lake Swamps	0.0008	0.1015	123
West Bank NFSLR	Stream and Lake Swamps	0.0011	0.0254	23
West Bank NFSLR	Live Oak	0.0018	0.0761	41
East Bank NFSLR	Live Oak	0.0020	0.0703	35
Total		**0.00716**	**0.3240**	**45**
Alternative 6A				
East bank NFSLR	Stream and Lake Swamps	**0.0015**	**0.1012**	**69**

also use the SPSP for the support structures for Alternatives 1C, 1F and 6B and, therefore, would not be considered an avoidance alternative. Additionally, a segmental bridge construction is not considered to be a prudent avoidance alternative for Alternative 6A since it would result in severe social impacts on both sides of the NFSLR. This bridging option was eliminated as a feasible and prudent avoidance alternative.

6.2.4.2.8 Pile Bent Substructure

The pile bent construction technique installs a series of piles using a top down construction method, or construction methods from temporary platforms, trestles, or other similar methods and then connects the pile series using cast-in-place pile caps or precast pile caps. Then a precast flat slab or Florida I-Beam (with topping or deck, respectively) is placed on the pile caps. The process is repeated until the bridge is completed. As noted in Section 6.2.4.2.6 (Prestressed Post Tensioned (Spliced) Beam Alternative) there is a preference for locating piers in the water as opposed to the use of larger supporting substructure elements in adjacent wetland habitat. This option minimizes overall habitat impacts. Therefore, a pile bent

substructure is the most viable and least harmful option for crossing the AP because it incorporates all possible planning to minimize harm. All build alternatives, including the Preferred Alternative, were consequently evaluated using a pile bent substructure and a use of the AP [Section 6.6 (Evaluation of Alternatives)].

6.2.4.3 Summary of the Evaluation of Alternatives to Avoid Use of the AP

No feasible and prudent alternatives exist to avoid a new crossing of the NFSLR. In addition, no feasible and prudent alternatives exist to completely span the AP (and the SPSP). The two tunnel alternatives are feasible but have been eliminated as imprudent. A cable-stayed bridge is feasible but has been eliminated as imprudent. Numerous bridging options were examined including steel beams, high performance steel beams, prestressed concrete Florida I-beams, prestressed post-tensioned (spliced) beams, and a pile bent substructure. The bridging option with a pile bent substructure is the most viable and least harmful option for crossing the AP although this option will use lands from the AP. All other bridging options have been eliminated because of the magnitude of their impacts to the Section 4(f) property, they are not feasible, or they are imprudent.

6.2.5 Evaluation of Avoidance Alternatives for Kiwanis Park

Alternative 2D is the only build alternative that would use lands from Kiwanis Park. The only option to avoid Kiwanis Park is the No Build Alternative. However, the No Build Alternative does not address the project's purpose and need and is therefore eliminated as an avoidance alternative..

6.3 Measures to Minimize Harm

The intent of Section 4(f) and the policy of the USDOT is to avoid the use of significant publicly-owned parks, recreational areas, wildlife and waterfowl refuges, and historic sites as part of a project unless there is no feasible and prudent alternative to the use of such land. All possible planning has been explored to identify prudent measures to avoid the use of Section 4(f) resources, as summarized above [and detailed in Sections 2.0 (Purpose of and Need for Action) and 3.0 (Alternatives Including Proposed Action) of this EIS].

All build alternatives, including the Preferred Alternative, utilize the pile bent substructure bridging option since it is the most viable and least harmful bridging option. Although the pile bent substructure bridging option involves a use of the AP for all build alternatives, it is the least harmful bridging option. All other bridging options to cross the AP and the SPSP were eliminated because of the magnitude of their impacts to these properties, they are not feasible, or they are imprudent. All possible planning has been taken to minimize harm to Section 4(f) resources. These measures are discussed in this section.

6.3.1 Measures to Minimize Harm for All Build Alternatives, Including the Preferred Alternative

For a number of years, the City has committed to a top down construction method, or construction methods from temporary platforms, trestles, or other similar methods, to avoid and minimize potential impacts to wetlands, listed species habitats, and essential fish habitat. FHWA has determined that these resources are protected attributes as Section 4(f) properties. These bridging methods have been selected because it would avoid or minimize ground-based equipment. These construction methods were examined for the EIS and have been determined to be feasible and minimize harm.

The technical advisory committees and the regulatory agencies have repeatedly expressed a preference for a construction technique that would have the least amount of environmental impact to wetlands, listed species habitats, essential fish habitat, and state-owned lands (which were determined to be Section 4(f) properties). For purposes of this Section 4(f) evaluation, the assessment of all build alternatives, including the Preferred Alternative is based on a top down construction method, or construction methods from temporary platform, trestles, or other similar methods. In addition, the pile bent substructure is the most viable and least harmful bridging option to cross the AP and the SPSP.

All possible planning has been undertaken to identify reasonable measures to avoid the use of lands and to minimize harm to Section 4(f) resources due to the Preferred Alternative. An extensive process of coordination (since 2003) with City, St. Lucie County (County), state, and federal agencies has resulted in a number of minimization strategies that have either been incorporated into all build alternatives developed for this project to date, including the Preferred Alternative (see the bulleted list that follows), or as a commitment that has been included in Section 9.0 (Commitments and Recommendations) as part of a future development phase.

- For all build alternatives, including the Preferred Alternative, the width of typical section was reduced over natural habitats. The 330-foot suburban typical section west of the NFSLR was reduced to a 143-foot bridge typical section over the AP and the SPSP. Through continued coordination with the cooperating agencies, the width of the bridge typical section was further reduced to 103 feet over the AP and the SPSP.
- The City has committed to a top down construction method, or construction methods from temporary platforms, trestles, or other similar methods, to avoid and minimize potential impacts to environmentally-sensitive resources. This can be accomplished by using the previously constructed portion of the permanent bridge as a work platform (top down) or by using a free-standing temporary work platform alongside the bridge (within the right of way or bridge footprint) to construct the next adjacent span ("trestle") without placement of equipment or personnel on the ground.[30] These construction techniques avoid (or minimize) the use of ground-based equipment. Conventional construction methods or partial top down bridge construction methods usually involve equipment, personnel, or materials on the ground and ground-based construction methods have been eliminated from consideration. No haul roads within the bridge easement will be used.
- Contractors will be selected based on their experience in top down construction method, or construction methods from temporary platform, trestles, or other similar methods for environmentally-sensitive areas.
- The top down construction method, or construction methods from temporary platform, trestles, or other similar methods will use driven precast concrete pile-supported bent foundations (versus drilled or other types of excavated foundations) to reduce benthic impacts within the NFSLR. Drilled shaft and spread footing foundations typically require ground-based construction equipment. No water jetting will be allowed.
- Bridge piers located in the water will be oriented to avoid restriction of water movement and to maximize the NFSLR hydraulic section.
- Stormwater management systems (ponds) have been located within the right of way or within already developed areas to avoid additional impacts to wetlands or other sensitive habitats.

[30] The trestle method is assumed in the EIS to provide a conservative estimate of potential impacts. If a top down or gantry method is used, construction impacts will be less than the trestle method.

- Retaining walls and/or MSE walls will be used to minimize the amount of right of way needed; sloped bridge approaches will not be used.
- Strict adherence to state and regional regulatory criteria pertinent to stormwater treatment and water quality will avoid impacts to the NFSLR, as detailed in the Water Quality Impact Evaluation (WQIE) and WQIE checklist.
- Scuppers[31] will not be used. All stormwater runoff will be directed to a drainpipe mounted below the bridge, which will convey runoff to the stormwater management system.
- The concept plans have been developed to locate bridge abutments to the maximum extent practicable outside of natural wetland and upland habitats to minimize fill impacts.
- The project area is located within the 100-year floodplain as identified on the Federal Emergency Management Agency Flood Insurance Rate Maps for St. Lucie County. As detailed in the *Location Hydraulic Report*, the concept plans for all build alternatives, including the Preferred Alternative, were developed to have minimal impacts on floodplains.
- Concept plans were developed with a low-level bridge that meets the USCG minimum-required bridge height to minimize visual impacts of the permanent structure [see Section 5.3.18 (Navigation), Section 5.3.20 (Permits required), and letter from the USCG.[32]
- Contractors will use noise attenuation techniques during in-water construction (e.g. bubble curtains[33]).
- Construction activities will be limited to timeframes that minimize disruption to wildlife.
- Specialized equipment will be used during geotechnical/soil investigations in sensitive habitats. This equipment minimizes impacts of drilling rigs, such as, rubber tire mounted equipment, amphibious track rigs, rigs mounted on all-terrain vehicles, and tripod drill rigs.
- Specialized lighting fixtures will be used to direct light onto the pavement (rather than lighting mounted on poles) to reduce light trespass into natural habitats and surrounding areas to the maximum extent practicable.
- Turbidity control devices, such as turbidity curtains or temporary steel casing, will be used during construction activities in the water.
- On the east side of the NFSLR, construction staging and construction site access areas will be limited to the footprint of the bridge approach roadway.
- Specific minimization techniques will be implemented during construction, such as adjusting the pile spacing to avoid or minimize effects on specific natural resources identified during construction.
- The Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction*, which contains numerous techniques and specifications, will be implemented to minimize impacts to natural habitats, residential neighborhoods, and businesses during construction.

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[31] Scuppers are openings at the edge of the bridge deck to allow water to drain directly into the receiving waters.

[32] Letter from USCG, dated July 27, 2012 (**Appendix A**).

[33] A confined bubble curtain is a circular- or square-shaped device made of rubber, plastic, or steel tubing that is placed completely around a pile and extends to the bottom of the water column. The bubbles produced within the curtain absorb the generated sound wave and limit its dissipation. An unconfined bubble curtain can also be used (bubbles only) if currents do not carry the bubbles downstream.

6.3.2 Measures to Minimize Harm for Specific Build Alternatives

6.3.2.1 Measures to Minimize Harm for Alternatives 2A, 2D, 1C, 1F, and 6B

6.3.2.1.1 Cable-stayed Bridge

A cable-stayed bridge was evaluated as a bridging option to avoid the use of the SPSP and the AP for all build alternatives. Because Alternative 6A would be located outside the SPSP, this bridge type was not considered for this alternative because more economical avoidance options for the AP exist for this alternative. The construction of a cable-stayed bridge was considered as a minimization measure for the use of the SPSP for the remaining build alternatives.

This bridging option is feasible but at least one support structure would be required within the SPSP because the entire length of the SPSP is longer than the practical length of this bridge type [Section 6.2.3.2.2 (Cable-stayed Bridge Alternative)]. Thus, the support towers would use lands from the SPSP and/or the AP. The support towers would use approximately the same amount of lands in the SPSP/AP as the combined area of other-supported structures. In addition, the height of the towers would have substantial visual impacts in the residential community and the low-rise commercial corridor along U.S. 1. Visual impacts would also be substantial within the natural setting of the SPSP and the AP. This bridge option would require the use of steel cables (which would require regular maintenance in a corrosive environment) and is not recommended for use in high wind conditions. This option would also have a substantially higher cost than other bridge types. It is also anticipated that ground-based and/or barge-based construction equipment would be required to construct the support towers, increasing temporary occupancy considerations in the SPSP. This bridging option would not minimize the use of the SPSP and it has other non-Section 4(f) impacts. For these reasons, this bridging option is eliminated as a minimization measure for all build alternatives, including the Preferred Alternative.

6.3.2.1.2 Tunnel

Two tunnel options were evaluated as minimization measures to avoid the use of the SPSP and the AP. Both tunnel options are feasible. The tunnel option along the alignment of Alternative 1C would require relocating U.S. 1 eastward or developing a new connection to U.S. 1 at the eastern terminus to avoid all use of the SPSP and the AP. Relocation of U.S. 1 or the new connection, either northward to connect to Savanna Club Boulevard or southward via a widened Village Green Drive to Walton Road, would require substantial parcel acquisitions. Without a realignment of U.S. 1 or development of a new connection to U.S. 1, the eastern terminus would need to use approximately six acres of the SPSP. The tunnel option along the alignment of Alternative 1F would require 17 to 18 additional relocations to avoid the use of the SPSP. To avoid the relocations, the eastern terminus would use approximately three acres of the SPSP. Both options would use an amount of land that is far greater than the amount of land required for the placement of piers in the SPSP (0.01 to 0.02 acres). Thus, the tunnel options are not considered a minimization measure for any of the build alternatives, including the Preferred Alternative.

6.3.2.2 Measures to Minimize Harm for Alternatives 1C, 1F, and 6A

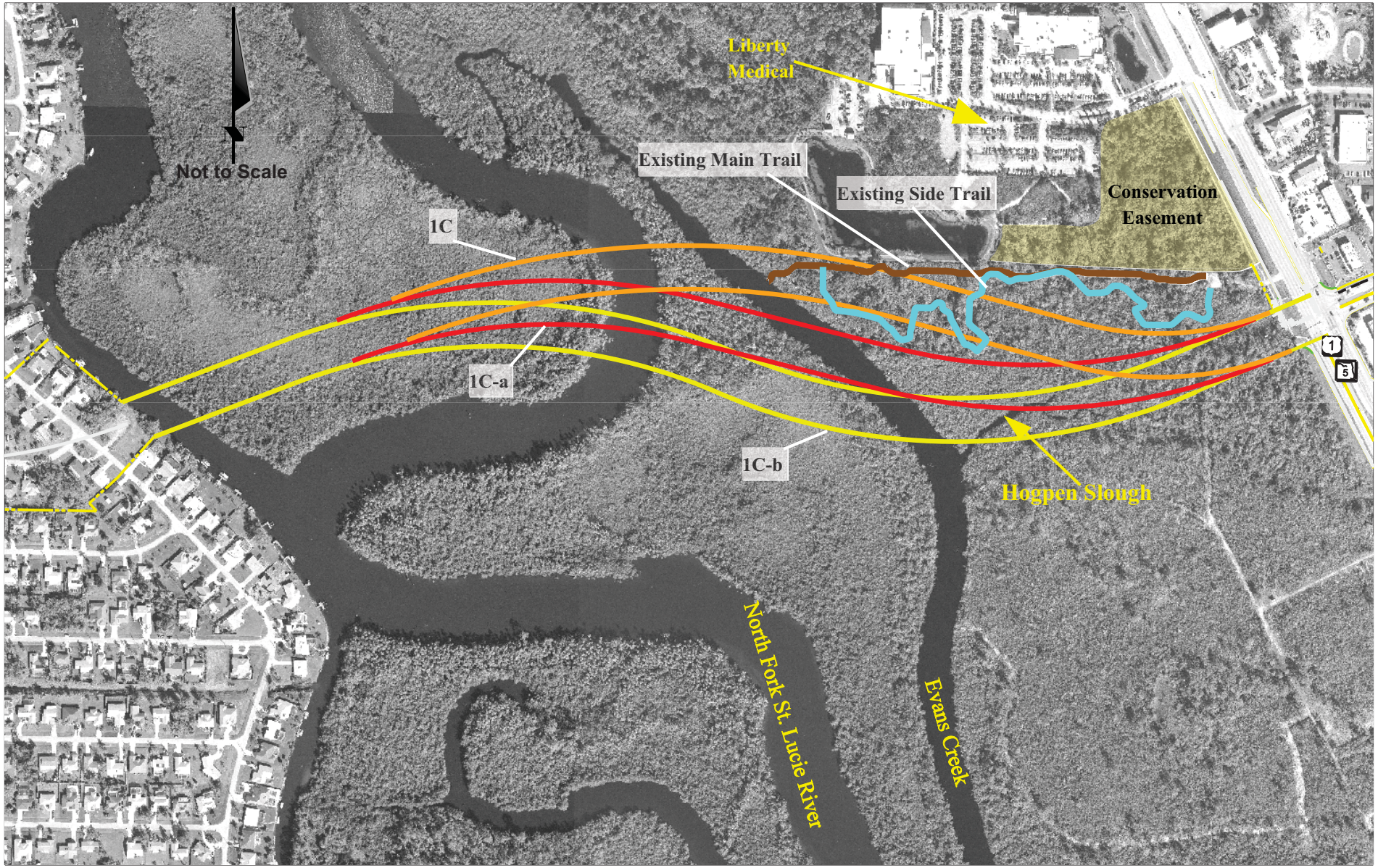
As discussed in Section 6.2.4.2.6 (Prestressed Post Tensioned (Spliced) Beam Alternative), this bridging option was examined as an avoidance alternative for the AP. It can also be examined as a minimization measure for the three build alternatives for which these techniques are feasible (Alternatives 1C, 1F, and 6A). The amount of land used for spliced beam support structures would be far greater than pile bent support structures because the footings are 15 times larger to support the additional loads. Thus, the spliced beam bridging option is not considered a minimization measure for these build alternatives, including the Preferred Alternative.

6.3.2.3 Measures to Minimize Harm for Alternative 1C (Preferred Alternative)

The alignment of the Preferred Alternative will affect the nature trails and dock at Halpatiokee. Minimization measures were examined to avoid or minimize use requirements at the Halpatiokee facility (all other build alternatives would avoid this facility). One option considered would pass to the north of the existing facility, spanning the stormwater pond on the Liberty Medical property. This option is not feasible because it would introduce a sharp reverse curve (S-shape) into the alignment on the approach to the intersection with U.S. 1, which does not meet design criteria. A second option, shown in **Figure 6.6** as Alternative 1C-a, would be aligned south of the Halpatiokee facility but could pass over one of the side trails. Depending on the bridging option, this alternative could sever, at a minimum, one of the side trails. The third option, shown as Alternative 1C-b, would be aligned further south and would avoid all of the nature trails.

Minimization Alternatives 1C-a and 1C-b have been eliminated from further consideration because of the following concerns:

- The stormwater pond on the Liberty Medical property will receive stormwater runoff for the Preferred Alternative. A stormwater pond originally located near U.S. 1 was moved to address FDEP's objections to its location within the SPSP and to avoid additional acquisition of Section 4(f) property, wetlands, and a conservation easement on the Liberty Medical site (adjacent to U.S. 1). Alternatives 1C-a and 1C-b would require, a conveyance to drain stormwater to the pond. This would require an underground piping system and an easement, which could still sever or affect the trails. Another solution would be a new pond north or south of the touchdown at U.S. 1, either south of Hogpen Slough or near U.S. 1, which would require additional use of the SPSP.
- Both alternative alignments would pass over or near Hogpen Slough; both pass over the slough's floodplain. The FDEP considers Hogpen Slough to be an important part of the SPSP and AP. It provides drainage for the properties east of U.S. 1. Both alignments could require relocation of the slough and/or floodplain replacement.
- Alternatives 1C-a and 1C-b would use approximately the same amount of Section 4(f) properties, although they would use more wetlands than the proposed alignment. Both would avoid the upland habitats.
- The new alignments would be located close enough to an active eagle's nest, located south of Hogpen Slough, to require USFWS consultation under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.
- Even if these trails are avoided, the use and enjoyment of the trails may be compromised due to the proximity of the new roadway.



Note: Location of side trail is approximate.

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Alternative 1C Alignment Shifts to Avoid Halpatiokee Canoe & Nature Trail

Figure 6.6

As discussed in Section 6.1.1 (North Fork St. Lucie River Aquatic Preserve), the existing unpaved trails are in poor condition. They pass through floodplain wetlands that are inundated or flooded most of the year. In addition, with the compensatory mitigation plan, Halpatiokee would be replaced under all build alternatives, as described in Section 6.7 (Compensatory Mitigation for Section 4(f) Uses). Because the trail could be readily replaced by an improved facility 1,000 feet to the south and because of the substantial additional impacts to wetlands and floodplains, the effort to realign Alternative 1C to avoid or minimize the use of the Halpatiokee trails is unwarranted and eliminated from further consideration.

The alignment shifts were sent to the FDEP for comment. The FDEP response did not include an opinion on the alternative alignments[34]. Coordination with the FDEP regarding the Halpatiokee improvements indicated that regardless of the alignment of the Preferred Alternative, the utility of the Halpatiokee facility would be compromised because the access driveway would be located too close to the intersection of the Crosstown Parkway Extension and U.S. 1.[35]

6.3.2.4 Measures to Minimize Harm for Alternative 2D

Minimization measures were examined for Alternative 2D to avoid or minimize the use of Kiwanis Park (all other build alternatives would avoid Kiwanis Park). The roadway right of way of Alternative 2D was reduced to the maximum amount possible in the vicinity of the Park in an effort to avoid use of park lands. However, to provide the necessary six travel lanes, bicycle lanes, and sidewalks, some use of the Park (1.06 acres) would be necessary. Two options were developed to completely avoid the use of Kiwanis Park (**Figure 6.7**). One option, shown as the Standard Typical Section, would be constructed to avoid all use of Kiwanis Park. To maintain the full typical cross section (parkway), including the landscaped berm (except along the east side of Kiwanis Park), the realignment of the roadway to the east would be required. This would eliminate any permanent acquisition of Kiwanis Park and would eliminate the need to relocate three residences west of Floresta Drive but would require the relocation of 18 residences on the east side of Floresta Drive (a net increase of 15 residences).

The second option, shown in **Figure 6.7** as the Reduced Standard Typical Section, would reduce the typical section to allow for a 6-foot wide area behind the sidewalk to tie into the existing ground but would eliminate the landscaped berm on the east side. This option would completely avoid any use of Kiwanis Park and would avoid the need to relocate three residences west of Floresta Drive. However, it would require the relocation of nine additional residences east of Floresta Drive (a net increase of six residences).

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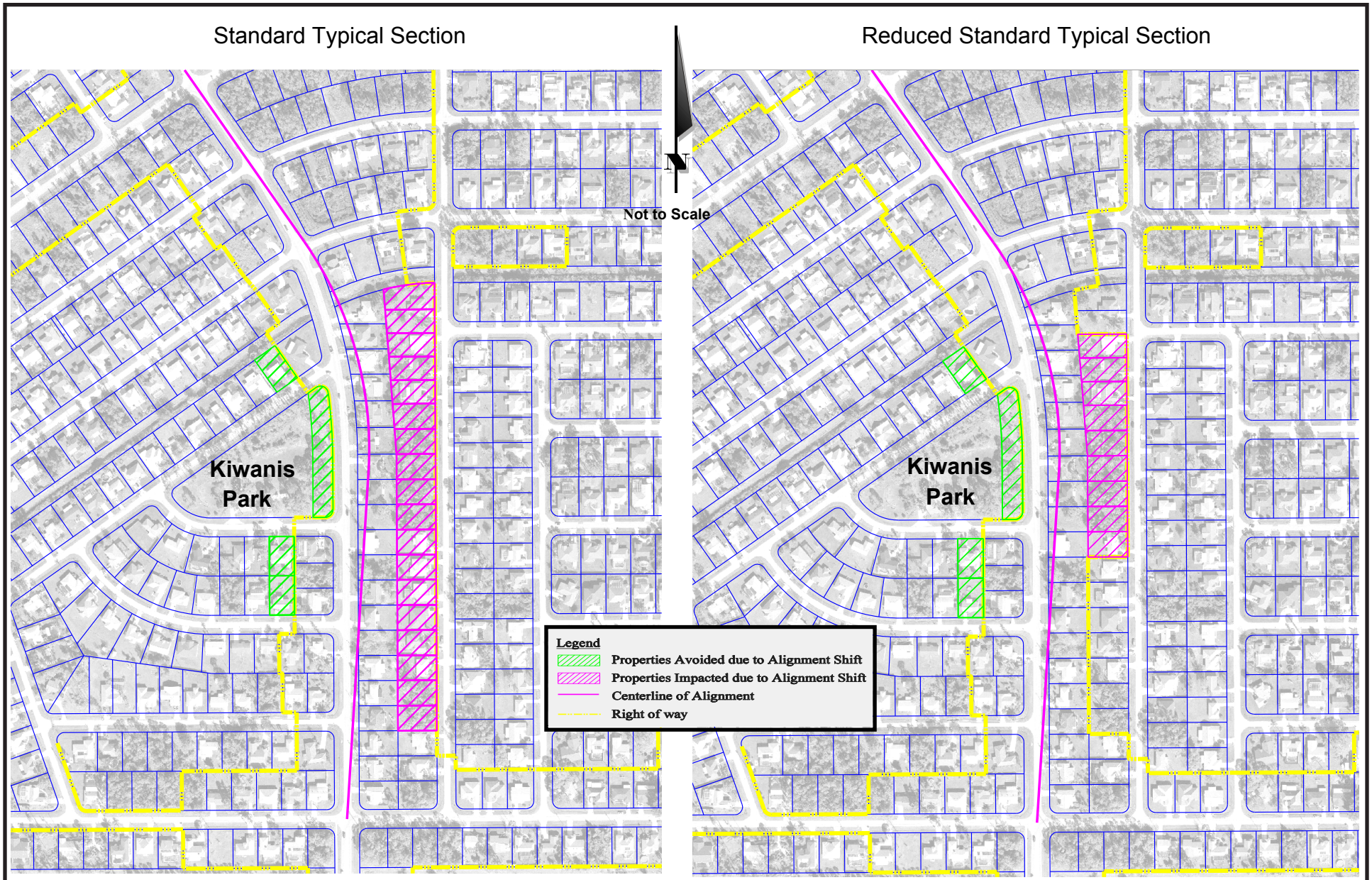
[34] Email from Paul Rice, FDEP, dated October 19, 2010; **Appendix A**.

[35] Record of telephone conversation with Paul Rice, FDEP, October 6, 2010 (**Appendix I**) and meeting minutes with FDEP staff, dated July 10, 2012 (**Appendix A**).



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ETDM No. 8247

Crosstown Parkway Extension PD&E Study and Environmental Impact Statement

Alternative 2D Alignment Shifts to Avoid Use of Kiwanis Park

Figure 6.7

6.4 Use of Section 4(f) Properties

Under the provisions of Section 4(f), a "use" of Section 4(f) property occurs:

- When land is permanently incorporated into a transportation facility;
- When temporary occupancy of land is adverse in terms of the statute's preservationist purposes; or
- When a constructive use of a Section 4(f) property occurs [Section 6.5 (Constructive Use Determination)].[36]

To ensure temporary occupancies of land are so minimal as to not constitute a use within the meaning of Section 4(f), the following conditions[37] must be satisfied:

- The duration of the work must be temporary and ownership of the land should not change;
- The scope of work must be minor so that both the nature and magnitude of the changes are minimal;
- No anticipated permanent adverse physical impacts can occur and no interference can be made to the protected activities, features, or attributes of the property either on a temporary or permanent basis;
- The land must be fully restored to a condition that is at least as good or better than conditions prior to the project; and
- The official with jurisdiction over the property must agree to these conditions.

The use of a Section 4(f) property varies by alternative, but would be related to the following actions: placement of fill for the bridge approaches, right of way to be acquired, placement of fill at the locations of the bridge pilings, and construction and excavation of stormwater pond sites. The approaches and pond sites make up nearly all of the use (over 99 percent) and the remainder is due to the placement of piers. It must be noted that a use defined under Section 4(f) is not necessarily the same as impacts quantified under NEPA. For example, Section 4(f) applies only if fill, excavation, piers, or other structural components are located in a Section 4(f) property resulting in a permanent incorporation into a transportation facility. Shading under the bridge, treated as a direct impact under NEPA, as discussed in Section 5.3.5.1 [Direct Impacts (Wetlands)], is not a Section 4(f) use. Various bridging options that could avoid a use were also considered. As discussed in Section 6.3 (Measures to Minimize Harm), direct uses have been minimized to the maximum extent practicable. **Table 6.6** summarizes the quantified acres of use, as defined by the Section 4(f) statute for each build alternatives, including the Preferred Alternative. **Table 6.6** also summarizes the types of natural habitats located in the AP and the SPSP that are affected by each of the build alternatives. This section discusses the Section 4(f) use for each of the protected properties.

6.4.1 North Fork St. Lucie River Aquatic Preserve

Under the No Build Alternative, no changes would be made to the existing bridge crossings, no new bridge would be constructed, and there would be no use of the AP. Because the AP extends north and south of the project area, all six build alternatives, including the Preferred Alternative, would cross the AP. Based on the evaluation of the avoidance alternatives and minimization measures, the construction of a bridge using a pile bent substructure is the most viable and least harmful alternative/bridging option even though this bridging option would use the AP. This bridging option also minimizes the use of the SPSP and minimizes other non-Section 4(f) impacts (e.g., impacts to essential fish habitat and listed species habitat).

[36] Source: 23 CFR Section 774.17 (Definitions: *Use*).
[37] Source: 23 CFR Section 774.13(d)(1-5).

Table 6.6 Comparison of Build Alternatives and Type of Section 4(f) Resource Affected[1]

Alternative	AP			SPSP			Kiwanis Park			Total Section 4(f) Use (ac)
	Use (ac)	Percent Total Property	Section 4(f) Resource	Use (ac)	Percent Total Property	Section 4(f) Resource (west to east)	Use (ac)	Percent Total Property	Section 4(f) Resource	
2A	0.02	0.00067	Submerged lands at locations of piers (no seagrass or benthic habitats)	5.33	0.074	FM, FMS, MS, LO, SLS, MWH, PF	0	0	None	5.35
2D	0.02	0.00067	Submerged lands at locations of piers (no seagrass or benthic habitats)	5.33	0.074	FM, FMS, MS, LO, SLS, MWH, PF	1.06	27.8	Vacant park lands adjacent to Floresta Drive (no facilities)	6.41
1C	0.02	0.00067	Submerged lands at locations of piers (no seagrass or benthic habitats)	2.21	0.029	MS, FMS, SLS, LO, PF, FM Halpatiokee Canoe and Nature Trail	0	0	None	2.23
1F	0.01	0.00034	Submerged lands at locations of piers (no seagrass or benthic habitats)	4.27	0.059	MS, FMS, LO, SLS, PF	0	0	None	4.28
6B	0.01	0.00034	Submerged lands at locations of piers (no seagrass or benthic habitats)	2.83	0.039	MS, FMS, LO, SLS	0	0	None	2.84
6A	0.01	0.00034	Submerged lands at locations of piers (no seagrass or benthic habitats)	0	0	None	0	0	None	0.01
No Build	0	0	None	0	0	None	0	0	None	0

[1] Assumes a top down construction method or construction methods from temporary platforms, trestles, or other similar methods using a pile bent substructure.
PF = Pine Flatwoods; LO = Live Oak; MS = Mangrove Swamps; SLS = Stream and Lake Swamps;
MWH = Mixed Wetland Hardwoods; FM = Freshwater Marsh; FMS = Freshwater Marsh with Shrubs, Brush, and Vines

The use of the AP involves the placement of piles for all build alternatives, including the Preferred Alternative. The Preferred Alternative will use a small portion (0.00067 percent) of the 2,972 acres of the AP area along the 16 river miles of the NFSLR and a very small use (0.0085 percent) of the portion of the

AP within the project area (234 acres). No seagrasses or benthic habitats are present within the project area, as documented in Section 4.3.15 (Essential Fish Habitat). Thus, the piers would be placed in the portion of the AP that does not contain significant benthic aquatic habitats. The water column does provide aquatic habitat for managed fishery species and listed species. The Preferred Alternative will not harm the aquatic environment nor impede the daily or seasonal migration of aquatic species within the AP.

Temporary construction-related occupancy within the AP will be related to pile-driving activities; or temporary construction platforms, trestles, or other supports necessary to construct the spans over the AP. Temporary occupancy due to construction of the Preferred Alternative will use a very small area within the AP. It is estimated that the Preferred Alternative will have a temporary occupancy of 0.011 acre and was calculated based on a cross sectional area around the foundation supports. To maintain navigation, it is also likely that the bridge over the main channel of the NFSLR for the Preferred Alternative will be constructed using barges as construction platforms. The utilization of barges in the AP instead of temporary trestles will decrease the temporary occupancy in the AP to a fraction of the amount required for temporary trestles. All possible planning will be utilized to avoid, minimize, and restore lands from construction activities. FDEP, the agency with jurisdiction over the management of the AP and the SPSP, has reviewed the proposed construction techniques and has concurred with these findings.[38]

6.4.2 Savannas Preserve State Park

Under the No Build Alternative, no changes would be made to the existing bridge crossings, no new bridge would be constructed, and no Section 4(f) lands would be incorporated into a transportation facility. Alternative 6A was developed to pass north of the SPSP so that it would completely avoid the use of this property (although this alternative would still affect wetlands, listed species habitat, and essential fish habitat, as would the other build alternatives). All other build alternatives would use lands from the SPSP.

For all build alternatives (except Alternative 6A), including the Preferred Alternative, the use of lands in the SPSP varies by alternative, and would be related to the following activities: placement of fill for the bridge approaches, right of way to be acquired, fill for the bridge pilings, and construction and excavation of stormwater pond sites (**Table 6.6**). Alternatives 2A/2D (both alternatives are identical within the SPSP) would use the most lands in the SPSP, with 5.33 acres of use. Alternative 1F would have less use, with 4.27 acres. Alternative 6B would have 2.83 acres of use; Alternative 1C (Preferred Alternative) would have 2.21 acres of use; Alternative 6A would use no lands. Alternative 1C is the only alternative that would use lands located in Halpatiokee, which is associated with the Section 4(f) protected recreational functions of both the AP and the SPSP.

The No Build Alternative and Alternative 6A would avoid temporary occupancy in the SPSP. The Preferred Alternative will have temporary occupancy of 0.94 acres, which is 0.013 percent of the SPSP. All other build alternatives would have lesser temporary occupancy (ranging from 0.42 acres for Alternative 6B to 0.69 acres for Alternative 2A/2D). Lands disturbed during construction activities will be fully restored in accordance with permit conditions. All possible planning will be utilized to avoid, minimize, and restore lands from construction activities. FDEP, the agency with jurisdiction over the management of the AP and the SPSP, has reviewed the proposed construction techniques and has concurred with these findings.[38]

[38] Letter from Matthew Klein, FDEP, dated January 30, 2013 (**Appendix A**).

6.4.3 Kiwanis Park

Alternative 2D would require right of way along Floresta Drive and would require the acquisition of 1.06 acres (27.8 percent) from Kiwanis Park **(Table 6.3)** immediately adjacent to and parallel to the existing roadway (the park is approximately 3.8 acres in size). The entrance, parking, lot, and play equipment at the Park would not be affected by the permanent acquisition within the right of way. The No Build Alternative and the other five build alternatives, including the Preferred Alternative, would avoid using lands from this property.

The roadway section along Floresta Drive has been reduced to the maximum extent possible to minimize lands needed to be acquired in the Park. Under Alternative 2D, access to the park would be improved by the construction of a dedicated right-turn lane from Floresta Drive and the access point from Breakwater Avenue would remain unchanged. In addition, pedestrian facilities would be enhanced by providing 8-foot sidewalks on both sides of the roadway. Bicycle facilities would be constructed along Floresta Drive, consisting of a 5-foot designated bicycle lane adjacent to the outside travel lanes in each direction. Thus, non-vehicular access to the Park would be improved. The selection of the No Build Alternative or any of the other five build alternatives, including the Preferred Alternative, would leave vehicular and non-vehicular access to the park unchanged.

6.5 Constructive Use Determination

Under Section 4(f), a "constructive use" occurs when the project does not incorporate land from a Section 4(f) property, but the project's "proximity impacts" are so severe that the protected activities, features, or attributes that qualify the property protected under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished (23 CFR Section 774.15). Alternative 6A would not incorporate land from the SPSP, but would be located near the SPSP. Thus, a constructive use analysis is required for this alternative. Similarly, Alternatives 2A, 1C, 1F, 6B, and 6A would not incorporate land from Kiwanis Park (only Alternative 2D would use Kiwanis Park lands) so that a constructive use analysis is required for Kiwanis Park for these five build alternatives.

Proximity impacts to the SPSP from Alternative 6A would be primarily visual, noise, wetland water quality, and lighting changes that could be perceived by recreational users of the SPSP. However, the closest public access to the SPSP is Halpatiokee, which is located approximately 1,700 feet to the south. Thus, it is highly unlikely that Alternative 6A would substantially diminish the protected activities, features, or attributes of the SPSP. Thus, proximity impacts from Alternative 6A would not constitute a constructive use.

Alternatives 2A, 1C, 1F, 6B, or 6A could conceivably have proximity effects for Kiwanis Park. However, each of these alternatives is located approximately 0.2 miles from the Park so that visual, noise, or lighting effects are unlikely to affect its protected activities, features, or attributes. Access to the Park (either permanently or temporarily) would be unaffected. Thus, proximity impacts from any of these alternatives would not constitute a constructive use.

6.6 Evaluation of Alternatives

The first step in the evaluation of alternatives under Section 4(f) is to determine if the project has a *de minimis* impact. A *de minimis* impact is one that, after taking into account any measures to minimize harm (such as avoidance, minimization, mitigation or enhancement measures), results in either:

- A Section 106 finding of no adverse effect or no historic properties affected on a historic property; or
- A determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f).

This project does not qualify as a *de minimis* impact project.

The next step under Section 4(f) is to examine which alternatives, if any, avoid the Section 4(f) property and are both feasible and prudent. An avoidance alternative is feasible if it is technically possible to design and build. A prudent avoidance alternative is more difficult to define because it involves the weighing of various criteria. An avoidance alternative is considered prudent unless it meets one or more of the following criteria:

- It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need; it results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes:
  - Severe social, economic, or environmental impacts;
  - Severe disruption to established communities;
  - Severe disproportionate impacts to minority or low income populations; or
  - Severe impacts to environmental resources protected under other federal statutes;
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- It causes other unique problems or unusual factors; or
- It involves multiple factors that, while individually minor, cumulatively cause unique problems or impacts of an extraordinary magnitude.[39]

It is also noted that if an avoidance alternative for a particular Section 4(f) property would cause an impact to another Section 4(f) property, then it is not considered an avoidance alternative.

Avoidance alternatives for the SPSP, AP, and Kiwanis Park were discussed in Sections 6.2.3, 6.2.4, and 6.2.5, respectively. As previously discussed and as summarized in **Table 6.7**, all build alternatives, including the Preferred Alternative, use at least one Section 4(f) property; therefore, no feasible and prudent avoidance alternative exists.

The next step in the process involves an analysis to determine which of the remaining alternatives would cause the least overall harm. Only the alternative, after considering mitigation, that causes the least overall harm can be approved. Least overall harm is determined by balancing the following seven factors:

- The ability to mitigate adverse impacts to each Section 4(f) resource (including any measures that result in benefits to the property);

[39] Source: 23 CFR Section 774.17 (Definitions: *Feasible and prudent avoidance alternative*)

Table 6.7 Comparison of Alternatives Regarding Standards for the Selection of a Prudent Alternative

Alternative	Section 4(f) Use (acres)			Total Section 4(f) Use	Standards for the Selection of a Prudent Alternative [1]								
	AP[2] (% total property)	SPSP[3] (% total property)	KP[4] (% total property)		Compromises Project's Purpose and Need	Unacceptable Operation or Safety Problems	Severe Social, Economic, or Environmental Impacts (After Mitigation)	Severe Disruption to Established Communities (After Mitigation)	Severe Disproportionate Impacts to Minority or Low-income Populations (After Mitigation)	Severe Impacts to Environmental Resources Protected by other Federal Statutes (After Mitigation) [5]	Additional Extraordinary Construction, Maintenance, or Operational Costs	Other Unique Problems or Unusual Factors	Cumulative Unique Problems or Extraordinary Impacts
2A	0.02 [0.00067]	5.33 (0.074)	0	5.35	No							New visual elements and noise (bridge and stormwater ponds) for residents along Oakmont Lane and Buckingham Terrace	
2D	0.02 [0.00067]	5.33 (0.074)	1.06 (27.8)	6.41	No	Alternative partially isolates community east of Floresta Drive between West Virginia Drive and Walters Terrace, creating safety and mobility problems						Only alternative that would use land from Kiwanis Park	Collective operational, safety, cohesion and mobility impacts to neighborhoods on the west side of the NFSLR
1C	0.02 [0.00067]	2.21 (0.029)	0	2.23	No							Only alternative that would affect Halpatiokee Canoe and Nature Trail (within SPSP)	
1F	0.01 [0.00034]	4.27 (0.059)	0	4.28	No		Affects cooperative (La Buona Vita); costs are shared by fewer residents (same as Alternative 6B)	Substantial cohesion and local mobility impacts to La Buona Vita (same as Alternative 6B)	Substantial impacts to the residents of La Buona Vita (residents aged 55+ years; same as Alternative 6B)			Substantial visual and noise impacts for residents of La Buona Vita (same as Alternative 6B)	Collective social, cohesion, mobility, visual and noise impacts to the cooperative (La Buona Vita) on the east side of the NFSLR
6B	0.01 [0.00034]	2.83 (0.039)	0	2.84	No		Affects cooperative (La Buona Vita); costs are shared by fewer residents (same as Alternative 1F)	Substantial cohesion and local mobility impacts for La Buona Vita (same as Alternative 1F)	Substantial impacts to the residents of La Buona Vita (residents aged 55+ years; same as Alternative 1F)			Substantial visual and noise impacts for residents of La Buona Vita (same as Alternative 1F) and for residents along diagonal route	Collective social, cohesion, mobility, visual and noise impacts to the cooperative (La Buona Vita) on the east side, and residents on west side of the NFSLR

Table 6.7 Comparison of Alternatives Regarding Standards for the Selection of a Prudent Alternative (continued)

Alternative	Section 4(f) Use (acres)			Total Section 4(f) Use (acres)	Standards for the Selection of a Prudent Alternative [1]								
	AP[2] (% total property)	SPSP[3] (% total property)	KP[4] (% total property)		Compromises Project's Purpose and Need	Unacceptable Operation or Safety Problems	Severe Social, Economic, or Environmental Impacts (After Mitigation)	Severe Disruption to Established Communities (After Mitigation)	Severe Disproportionate Impacts to Minority or Low-income Populations (After Mitigation)	Severe Impacts to Federally-protected Environmental Resources (After Mitigation) [5]	Additional Extraordinary Construction, Maintenance, or Operational Costs	Other Unique Problems or Unusual Factors	Cumulative Unique Problems or Extraordinary Impacts
6A	0.01 [0.00034]	0	0	0.01	No			Substantial community cohesion and local mobility impacts west of NFSLR; access road to La Buona Vita substantially changed	Potential Environmental Justice issue in neighborhood with higher than County average for minority populations			Substantial visual and noise impacts for residents along diagonal route; new access road required at entrance to La Buona Vita; new access road causes additional traffic noise; traffic flow changed within La Buona Vita	Collective operational, visual, noise, cohesion, mobility, and access impacts to neighborhoods on the west side of NFSLR and east of the NFSLR at La Buona Vita
No Build	0	0	0	0	Yes	Substantial intersection and arterial constraints throughout roadway network	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] Source: 23 CFR Section 774.17 (*Definitions: Feasible and prudent avoidance alternative)*
[2] Aquatic Preserve
[3] Savannas Preserve State Park
[4] Kiwanis Park
[5] All build alternatives would affect federally-protected environmental resources. However, it is anticipated that the compensatory mitigation plan, which is the same for all build alternatives, would result in a benefit to these resources (see Table 6.5).
Shaded cells indicate that the standards do not rise to the level of "severe," "unacceptable," or "extraordinary."

- The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each property for Section 4(f) protection;
- The relative significance of each Section 4(f) property;
- The views of the officials having jurisdiction over each Section 4(f) property;
- The degree to which each alternative meets the purpose and need for the project;
- The magnitude of any adverse impacts, after reasonable mitigation, to resources not protected by Section 4(f); and
- Substantial differences in costs among the alternatives.[40]

The first four of these factors relate to the net harm that each alternative would cause to the Section 4(f) property. The final three factors take into account any substantial problems on issues beyond Section 4(f).

6.6.1 Comparison of Alternatives Regarding Least Harm Analysis

This section summarizes the least harm analysis of the remaining build alternatives in terms of the seven least harm evaluation factors described in the previous section.

- *The ability to mitigate adverse impacts to each Section 4(f) resource (including any measures that result in benefits to the property).*

All alternatives are considered equal in their ability to mitigate their adverse impacts to Section 4(f) property. The mitigation measures are the same regardless of which alternative is selected and which Section 4(f) property is affected. The mitigation measures [Section 6.7 (Compensatory Mitigation for Section 4(f) Uses)] would result in a net benefit to Section 4(f) properties with all alternatives. This includes the addition of 108.55 acres of land to the SPSP. The mitigation plan has been formally agreed to by the FDEP (the agency with jurisdiction over the AP and the SPSP) in a Memorandum of Understanding (**Appendix L**), and has been coordinated with the resource and regulatory agencies.

- *The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each property for Section 4(f) protection.*

From a landscape perspective, the relative gross impacts to Section 4(f) property are modest (6.41 acres or less depending on the alternative). After mitigation, a net improvement is expected in natural resource functions and overall Section 4(f) property attributes. As such, all alternatives are considered equal with respect to mitigating for loss of any attributes or features that qualify each property for Section 4(f) protection. Although Alternative 1C would encroach upon the Halpatiokee Canoe and Nature Trail located within the SPSP, the agency with jurisdiction over this facility (FDEP), has approved the relocation and improvement of Halpatiokee 1,000 feet to the south as part of the Compensatory Mitigation Plan.

- *The relative significance of each Section 4(f) property.*

AP

Summarized from the FDEP (agency of jurisdiction) response to the Determination of Applicability dated July 25, 2007 (**Appendix A**), the Preserve and its natural communities provide a unique wilderness experience directly adjacent to the City of Port St. Lucie. Passive recreation is a common use of the Preserve. The Aquatic Preserve supports a unique combination of temperate and subtropical species, and

[40] Source: 23 CFR Section 774.3(c)(1).

is home to many rare fish species, many of which have been included on a list proposed for state and/or federal protection [discussed in Section 5 (Environmental Consequences)].

SPSP

Summarized from the FDEP (agency of jurisdiction) response to the Determination of Applicability dated August 7, 2007 (**Appendix A**), these lands help buffer the aquatic preserve from the water quality impacts presented by the surrounding urbanized environment. The property is an important regional recreational resource for boating, fishing, hiking, and nature study and considered a significant component of the state park system.

Kiwanis Park

Summarized from the City (agency of jurisdiction) response to the Determination of Applicability dated March 9, 2009 (**Appendix A**), this park serves active/passive needs of the immediate surrounding residents through the provision of a playground, picnic area, and open space, and is sponsored by the Kiwanis Club.

- *The views of the officials having jurisdiction over each Section 4(f) property.*

FDEP, the agency with jurisdiction and ownership of the AP and SPSP has been consulted extensively. This includes detailed discussions of alternatives and mitigation. FDEP has agreed that the mitigation plan compensates fully for the impacts and provides substantial benefits to the SPSP by increasing the park by 108.55 acres. In this regard, FDEP has indicated that it will provide the City the required easement for the Preferred Alternative (Alternative 1C).

The City owns the Kiwanis Park which is impacted by Alternative 2D. While not directly related to the Kiwanis Park, the City has expressed objections to Alternative 2D based on social impacts and performance from a traffic perspective.

- *The degree to which each alternative meets the purpose and need for the project.*

All of the build alternatives meet the purpose and need for the project. However, there are differences in the degrees to which each alternative meets the purpose and need.

As part of the alternatives analysis process, a two-tier process was used to determine the build alternative that would provide the most balanced relief to both Prima Vista Boulevard and Port St. Lucie Boulevard bridges. For Tier One, the data showed that Alternatives 2A, 2D, and 1C would provide the most relief to Port St. Lucie Boulevard bridge (over 20 percent) as compared to Alternatives 1F, 6B, and 6A (less than 20 percent).

For Tier Two, of the three build alternatives (2A, 2D, and 1C) that would relieve Port St. Lucie Boulevard the most, Alternative 1C would relieve Prima Vista Boulevard the most (52 percent as compared to 44 and 43 percent for 2A and 2D, respectively); – thereby providing the most balanced traffic relief for the two existing bridges.

Alternative 1C would, therefore, meet the purpose and need to a higher degree than any of the other build alternatives.

- *The magnitude of any adverse impacts, after reasonable mitigation, to resources not protected by Section 4(f).*

Impacts to non-Section 4(f) resources includes impacts from the project to the social, natural and physical environment that is not protected under Section 4(f). The magnitude of impacts from each build alternative to non-Section 4(f) resources varies (greatly in some instances) between the alternatives. The non-Section 4(f) impacts are primarily associated with the social environment. A least harm comparison of the build alternatives pertinent to this analysis factor follows below:

Alternative 2A would use lands from the SPSP and the AP but would not use land from Kiwanis Park. It would traverse diagonally across four residential streets near the western terminus but would not cause the isolation of any neighborhoods. This alternative would disrupt the largest number of continuous roadways in the area affecting local mobility [Section 5.1.1.1.2 (Community Cohesion)]; however, the impact to community cohesion does not appear to be as severe as Alternatives 1F, 6B, and 6A because an existing canal runs parallel to, and south of, Walters Terrace. This canal already provides an existing natural barrier to north-south travel between communities. The only roadways that cross the canal are Floresta Drive and SE Vine Street. Thus, Alternative 2A does not create major community disruptions to the extent of Alternatives 2D, 6B, and 6A west of the NFSLR. However, this alternative would cause visual [Section 5.3.2.2 (Views from Adjacent Lands of the Proposed Road and Bridge)] and noise impacts [Section 5.3.4.5 (Noise Barrier Analysis)] for the residents along Oakmont Lane and Buckingham Terrace east of the NFSLR where the new bridge and roadway would pass. Some disruption to this community would result from an additional new access connection into the community. The community between U.S. 1 and Veterans Memorial Parkway would have an incremental increase in noise and visual changes due to the new roadway. Both of these communities are located in census tract group blocks that are considered by the City to be low/moderate income communities where 45.2 percent of the households earn less than the median income for the Metropolitan Statistical Area [Section 4.1.1.1 (Existing Sociocultural Conditions)]. Neither community would be directly affected by Alternatives 2A or 2D because no acquisitions would be required within these neighborhoods [Section 5.1.1.5.2 (Environmental Justice)].

From a least harm perspective, although non-Section 4(f) impacts would occur with Alternative 2A, except for Alternative 1C, these impacts are considered to be not as severe as the other build alternatives. Therefore, Alternative 2A has been retained as a reasonable alternative for further consideration.

Alternative 2D would use lands from the AP, the SPSP, and Kiwanis Park (the only alternative that would affect Kiwanis Park). It would have unacceptable operational and safety problems for the community east of Floresta Drive between West Virginia Drive and Walters Terrace. It does not traverse diagonally across existing neighborhoods, but would cause substantial local community cohesion and mobility problems by partially isolating this neighborhood east of Floresta Drive between West Virginia Drive and Walters Terrace [Section 5.1.1.1.2 (Community Cohesion)]. This would also create a local safety concern for this neighborhood [Section 5.1.1.1.3 (Safety/Emergency Response)]. It may result in a collection of operational, safety, cohesion and mobility impacts to these neighborhoods on the west side of NFSLR. This alternative would also have the same social, noise, and economic concerns as Alternative 2A to the community along Oakmont Lane and Buckingham Terrace and the community between U.S. 1 and Veterans Memorial Parkway.

From a least harm perspective, Alternative 2D has been eliminated from further consideration due the magnitude of its impacts (especially when compared to Alternatives 2A and 1C) to non-Section 4(f) resources.

Alternative 1C (Preferred Alternative) would use the AP and the SPSP but would not use land from Kiwanis Park. It is the only alternative that would affect Halpatiokee Canoe and Nature Trail. However, the FDEP, the agency with jurisdiction over this facility, has approved the relocation and improvement of Halpatiokee 1,000 feet to the south as part of the Compensatory Mitigation Plan.[41] In comparing all build alternatives for the least harm analysis, this alternative would have notably fewer impacts to the established communities east and west of the NFSLR. Since Alternative 1C would be aligned along the existing West Virginia Drive on the west side of the NFSLR, this alternative would not have a requirement for a diagonal connection through existing neighborhoods [Section 5.1.1.1.2 (Community Cohesion)]. On the east side of the NFSLR, it would not pass through or near any residential or commercial areas. It would not have any effect on La Buona Vita. It has the fewest number of roadway modifications (but the same as Alternative 1F). It has the fewest number of residential relocations (compared with the other build alternatives) and no business relocations [Section 5.1.1.5.5 (Conceptual Stage Relocation Plan)]. Because it would be aligned along existing streets, there would be minimal impacts to the access into and out of established neighborhoods and it would have fewer visual [Section 5.3.2.2 (Views from Adjacent Lands of the Proposed Road and Bridge)] and noise impacts [Section 5.3.4.5 (Noise Barrier Analysis)] to residents along its route.

From a least harm perspective, Alternative 1C would result in less non-Section 4(f) impacts than Alternative 2A and considerably less overall non-Section 4(f) impacts compared with all other build alternatives. Therefore, Alternative 1C was retained as the most reasonable alternative under consideration.

Alternative 1F and Alternative 6B are similar for purposes of this evaluation. Both alternatives would use lands from the AP and the SPSP, but not from Kiwanis Park. Both alternatives would have substantial social and economic impacts and substantial community disruption to the La Buona Vita community east of the NFSLR [Section 5.1.1.1.2 (Community Cohesion) and Section 5.1.1.2 (Economic Impacts)]. Both alternatives would follow a similar alignment on the east side of the NFSLR, causing the relocation of up to 21 residences in La Buona Vita. Because this community is a cooperative, the relocation of residents would require costs to be shared by fewer residents, causing an economic impact to the remaining residents. Both alternatives would have substantial visual [Section 5.3.2.2 (Views from Adjacent Lands of the Proposed Road and Bridge)], noise [Section 5.3.4.5 (Noise Barrier Analysis)], cohesion, and mobility impacts [Section 5.1.1.4 (Mobility)] on this community. Because Alternative 6B would traverse diagonally across three residential streets on the west side of the NFSLR, it would result in additional visual [Section 5.3.2.2 (Views from Adjacent Lands of the Proposed Road and Bridge)] and noise impacts [Section 5.3.4.5 (Noise Barrier Analysis)] for residents along the diagonal route and local cohesion and mobility impacts in this part of the project area.

From a least harm perspective, Alternatives 1F and 6B have been eliminated from further consideration due the magnitude of their impacts (especially when compared to Alternatives 2A and 1C) to non-Section 4(f) resources.

[41] Meeting minutes between the City and FDEP, August 17, 2010 and October 5, 2010 (**Appendix I**). This agreement is also contained in the Memorandum of Understanding between the City and FDEP (**Appendix L**).

Alternative 6A would use the AP, but not the SPSP or Kiwanis Park. This alternative has the most severe and immitigable social impacts to communities on both sides of the NFSLR. The western portion of the parkway would traverse diagonally (approximately 0.5 mile) across six residential streets, creating substantial community cohesion [Section 5.1.1.1.2 (Community Cohesion) and local mobility impacts [Section 5.1.1.4 (Mobility)] through this established residential area, as well as substantial visual [Section 5.3.2.2 (Views from Adjacent Lands of the Proposed Road and Bridge)] and noise impacts [Section 5.3.4.5 (Noise Barrier Analysis)]. This alternative would also require the relocation of the access road into La Buona Vita community from its current location along U.S. 1 to the Crosstown Parkway Extension. The new access road would substantially change traffic flows within the community (a retirement community restricted to people 55 years old and over), increasing noise and visual impacts at the vicinity of the new access road. This series of negative impacts would have a collective adverse social impact to the neighborhoods on both sides of the NFSLR.

From a least harm perspective, Alternative 6A has been eliminated from further consideration because it would result in the most harm to non-Section 4(f) resources compared with all other build alternatives.

- *Substantial differences in costs among the alternatives.*

Although costs vary between the build alternatives, there are no substantial differences in costs among the alternatives.

6.6.1.1 Summary of Least Harm Analysis

In summary, based on a least harm evaluation, Alternatives 2D, 1F, 6B, and 6A have been eliminated from further consideration due to the magnitude of their impacts to non-Section 4(f) resources after reasonable mitigation. Of the two remaining alternatives (2A and 1C), Alternative 1C would result in the least overall net harm.

6.6.2 Selection of the Preferred Alternative

The Council on Environmental Quality guidance requires all federal agencies to identify a preferred alternative. As the lead agency, the FHWA is responsible for the adequacy of the EIS, the selection of the Preferred Alternative, and the Record of Decision (ROD). The standards for evaluating and eliminating alternatives under Section 4(f) are different than those under NEPA and the Section 4(f) process of alternatives evaluation is a process separate from NEPA. Under NEPA, all reasonable alternatives must be explained and objectively evaluated. Any alternative may be selected or rejected as long as it is sufficiently documented and justified. However, under Section 4(f), the use of land determined to be a Section 4(f) resource may not be approved unless there is no feasible and prudent alternative for such use. If alternatives use land from Section 4(f) resources, only the alternative that causes the least overall harm can be approved.

Information has been gathered for the *Corridor Report*, the *Alternatives Report,* the technical support documents, and the NEPA study process, including this EIS. The City, as the project sponsor, can express a preference through the selection of a Locally Preferred Alternative (LPA). The LPA selection process is described in Section 3.3.1 (Selection of the Preferred Alternative). After several weeks of discussion and coordination to develop an evaluation/scoring process for the selection of a LPA, on November 17, 2011,

senior management and staff from the City, the FDOT, and the TPO agreed upon a LPA for extending the existing Crosstown Parkway and selected Alternative 1C as the LPA. The decision to select Alternative 1C as the LPA was based on:

- Information in the Crosstown Parkway Extension DEIS (Notice of Availability published in the *Federal Register* on August 19, 2011);
- An evaluation process and criteria developed by the City in coordination with FDOT and FHWA;
- Agency and public comments; and
- Professional judgment (through the City's EIS consultant evaluation of the LPA).

After the scoring was completed, the LPA was evaluated against its compliance with Section 4(f) of the Department of Transportation Act. Section 4(f) was not part of the NEPA scoring process so that all build alternatives could be evaluated (not just the prudent and feasible alternatives). Nevertheless, Section 4(f) was an important part of the decision-making process and provided a final screening of the scored alternatives.

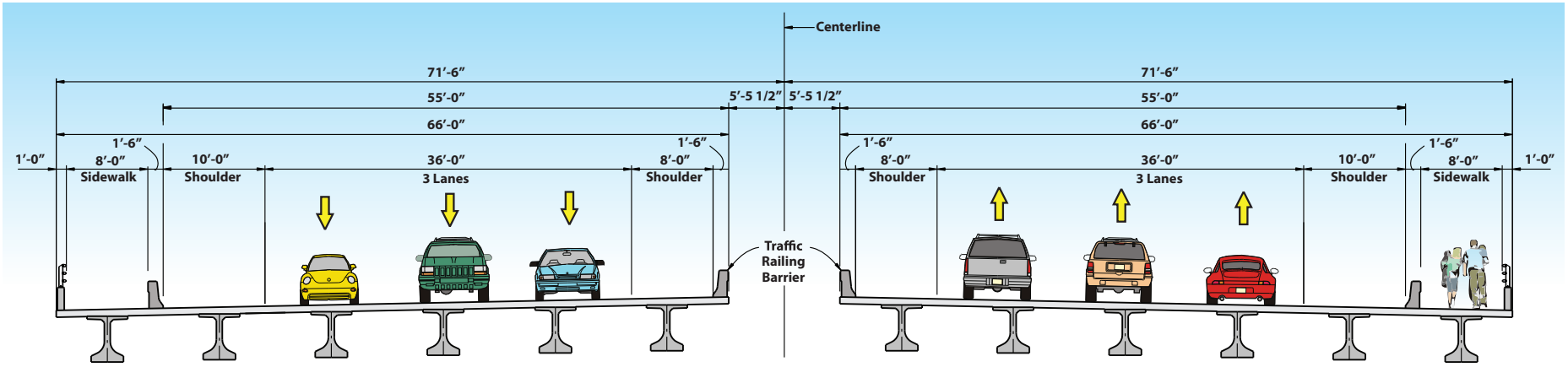
Based on this Section 4(f) Evaluation, there is no avoidance alternative that is feasible and prudent. The most viable and least harmful bridging option which incorporates all possible planning to minimize harm is a bridge constructed with a pile bent substructure. All build alternatives would use lands from the AP. All build alternatives would use lands from the SPSP, with the exception of Alternative 6A (which is located north of the SPSP boundaries). For Kiwanis Park, only Alternative 2D would use the property. Alternatives 2D, 1F, 6A, and 6B are eliminated because of their adverse impacts as previously discussed while Alternatives 2A and 1C are considered to be the most reasonable. Alternative 1C would result in the least overall net harm.

On January 23, 2012, the Port St. Lucie City Council adopted the selection of Alternative 1C as the LPA for the extension of the Crosstown Parkway from Manth Lane to U.S. 1 (Resolution 12-R18; **Appendix E**). With the compensatory mitigation plan [Section 7.0 (Avoidance, Minimization and Compensatory Mitigation)], of the two reasonable build alternatives, Alternative 1C has the least overall net harm. Based on this information and after coordination with the public, stakeholders, and the regulatory and cooperating agencies, Alternative 1C has been selected as the Preferred Alternative.

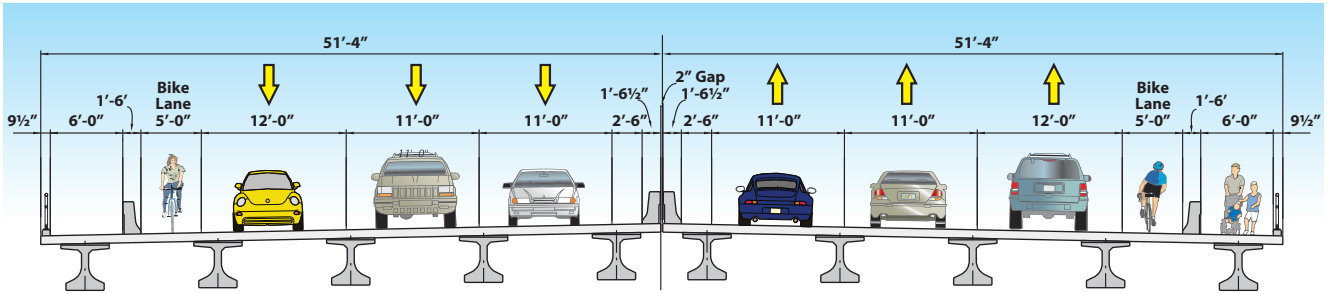
6.6.2.1 Additional Avoidance and Measures to Minimize Harm for the Preferred Alternative

Following the selection of the Preferred Alternative, additional avoidance and minimization measures were developed in coordination with NMFS, USACE, and USFWS (July to September 2012) to reduce the impacts of the Preferred Alternative to wetlands, listed species habitats, and essential fish habitat. These efforts also minimize harm for the use of Section 4(f) properties. Details of the efforts to minimize harm are detailed in Section 7.1.1 (Additional Avoidance and Minimization Measures for the Preferred Alternative).

The bridge typical section was reduced to from 143 feet to 103 feet (**Figure 6.8**). By reducing the bridge typical sections, the use of lands in the SPSP decreased from 2.21 acres to 2.14 acres, a reduction of 0.07 acres while the use of the AP is unchanged. Temporary occupancies increased somewhat in the AP and the SPSP with the reduced bridge because a temporary trestle will be constructed outside the footprint of the bridge (the temporary trestle for original bridge configuration was located between the twin bridges).



ORIGINAL TYPICAL BRIDGE SECTION
OVER NORTH FORK ST. LUCIE RIVER
MAIN CHANNEL SPAN



FINAL REDUCED BRIDGE TYPICAL SECTION
OVER NORTH FORK ST. LUCIE RIVER
MAIN CHANNEL SPAN

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FP No. 7777-087-A
ETDM No. 8247

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Bridge Typical Sections

Figure 6.8

Tree clearing will be conducted only where pilings are necessary for the trestle and the use of pipe piles will minimize the impacts associated with the pile placement and removal. The trestle and all supporting piles will be removed when the project is completed. Lands disturbed during construction activities will be fully restored in accordance with permit conditions. The FDEP, the agency with management jurisdiction over the AP and the SPSP have agreed that all possible planning has been utilized to avoid and minimize impacts to Section 4(f) resources from construction activities.[42]

6.7 Compensatory Mitigation for Section 4(f) Uses

As described in Section 3.1 (Project History), in 1994, the City sold land adjacent to the NFSLR to the FDEP to prevent its development, but with the anticipation of being allowed to construct a future crossing of the NFSLR along the West Virginia Drive corridor. In 1999, the City Council passed a resolution supporting the need for the corridor and instructed City staff to pursue an easement across the now state-owned land to complete the river crossing project. This involved coordination with the regulatory agencies and the FDOT. Ultimately, this led to the programming of FDOT funds in its Work Program to complete this EIS study.

During the ETDM process for the EIS, the USFWS assigned a degree of effect of "Dispute Resolution" for the categories of Special Designations, Wetlands, and Wildlife and Habitat. Subsequently, the Secretary of the FDEP suggested the City initiate a Conceptual Environmental Resource Permit (Conceptual ERP) concurrently with the EIS process. To secure an easement to cross state-owned lands and to resolve the dispute resolution, the City pursued an ambitious comprehensive mitigation plan that included a number of mitigation projects within the NFSLR watershed that were developed specifically for this project. This included a Regulatory[43] Mitigation Plan [Section 7.3.4 (Wetlands, Wildlife Habitat, and Essential Fish Habitat)] and a Proprietary[44] Mitigation Plan. The Regulatory Mitigation Plan provides compensatory mitigation for unavoidable direct and indirect impacts to wetlands (same as essential fish habitat), SSL, and navigable and non-navigable waters, as required under federal and state regulations. The Regulatory Mitigation Plan and the Proprietary Mitigation Plan also provide ecological benefits to state-owned lands and the features that qualify them as Section 4(f) properties. The Proprietary Mitigation Plan provides compensatory mitigation for obtaining an easement to cross state-owned lands and resulted in the resolution of the dispute.[45]

All possible planning has been undertaken to minimize harm to Section 4(f) properties affected by the Preferred Alternative. The most viable and least harmful bridging option for the Preferred Alternative is a bridge constructed with a pile bent substructure and this bridging option will use the AP and the SPSP. Coordination has been ongoing with the FDEP, the agency with management authority over the AP and the SPSP, to address the use of these properties.

[42] Letter from Matthew Klein, FDEP, dated January 30, 2013 (**Appendix A**).
[43] "Regulatory" refers to a type of governmental power, which allows an entity of the government to regulate private property as well as publicly-owned lands for the public good. The regulatory powers that the government agency has over private and public lands are granted by the state and by federal statutes and regulations.
[44] "Proprietary" refers to publicly-owned lands. These lands are held in trust by the State of Florida for all residents and are intended to be managed for the public benefit.
[45] Email from USFWS, dated November 28, 2012 (**Appendix A**).

Mitigation options were selected from the NFSLR Aquatic Preserve Management Plan with input from FDEP. On April 26, 2010, the City of Port St. Lucie entered into a Memorandum of Understanding (MOU) with the FDEP (**Appendix L**). The MOU states that the City will provide a Proprietary Mitigation Plan in exchange for an easement to cross the NFSLR. The MOU is valid for all build alternatives, including the Preferred Alternative, and includes:

- Design, permit, and construct four water quality improvement projects;
- Convey approximately 110 acres along the NFSLR to the Board of Trustees;
- Design, permit, and construct Recreational Opportunity – Trails; and
- Design, permit, and construct Recreational Opportunities – Other.

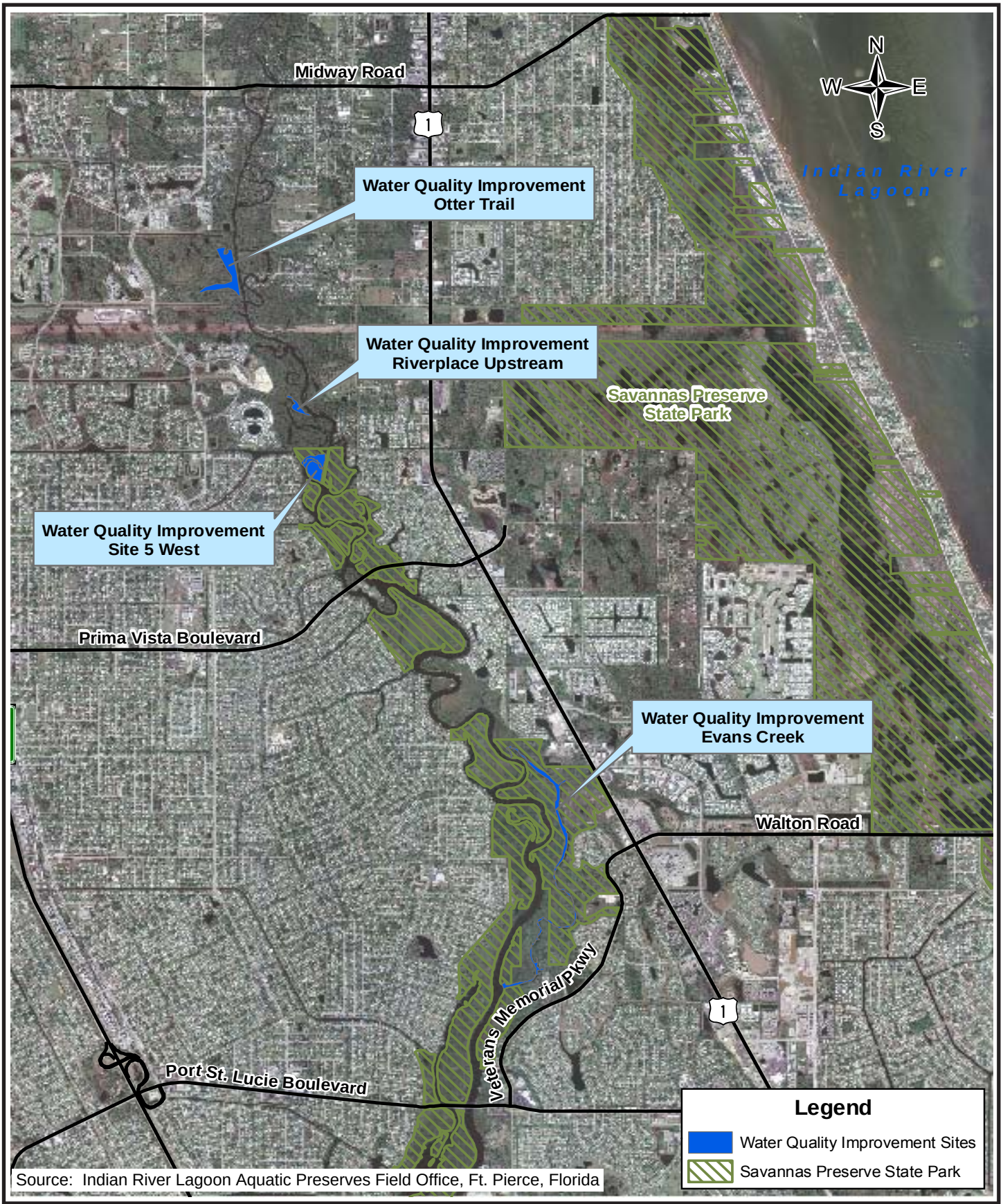
The cost of the Proprietary Mitigation Plan is estimated at $6.2 million, not including the cost of the acquisition of property to convey to the state. Details of the concept plans[46] of each mitigation project are contained in **Appendix M**. Ultimately, the Governor and the Cabinet, acting as the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, have proprietary (ownership) authority on SSL and decisions involving state-owned lands. They have been designated by the state legislature as the trustees of these lands and are responsible for their protection, preservation, and management. As a member of Acquisition and Restoration Council (ARC), the FDEP acts as staff to the Trustees so the FDEP can review both regulatory and proprietary requirements for the project.

6.7.1 Water Quality Improvement Projects

Many historic oxbows and floodplains were altered during the dredging and channelization of the NFSLR during the 1920s -1940s[47]. Many were cut off from flow by the placement of dredge spoil on the river banks; others have been altered by siltation over time. A number of water quality projects were included in the NFSLR Aquatic Preserve Management Plan (2009) as areas that require hydrologic restoration to improve water quality within the preserve. Of these, four projects are included in the Proprietary Mitigation Plan. These projects are Evans Creek, Site 5 West, Riverplace Upstream, and Otter Trail (**Figure 6.9)**. Restoration efforts will include dredging shoals or berms, widening or deepening portions of the waterway, and other work as identified by FDEP. As outlined in the MOU, the costs incurred by the City for the design, permitting, construction, and inspection of the four restoration projects shall not exceed $2,000,000. If the cost is expected to exceed that amount, the City will coordinate with FDEP to identify a replacement project or to reduce the scope of the current four projects until the total costs incurred are under $2,000,000. Costs will include water quality monitoring, biological monitoring, and vegetation sampling for one year prior to construction and for five years post construction. All areas that are disturbed during construction will be replanted with desirable, native species.

[46] Programming Document for Water Quality Improvement Projects, June 2011 (**Appendix M**).

[47] Historically, the slow and meandering path of the NFSLR allowed suspended solids to settle out of the water column and nutrients to be filtered by floodplain and shoreline vegetation. A flood control project conducted by the North St. Lucie Water Control District and USACE during the 1920s to the 1940s focused on straightening portions of the North Fork to promote rapid drainage of water to the middle and lower estuaries and eventually the Atlantic Ocean. In the process of straightening the river, the dredged spoil was piled into berms (mounds) along the banks of the new channel, which can measure up to 50 feet wide and 14 feet tall. The berms block former river bends and oxbows and isolate large portions of the floodplain. The direct river course affects the water quality and sediment loads reaching the estuary [Source: NFSLR Aquatic Preserve Management Plan (2009)].



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Water Quality Improvement Sites

Figure 6.9

The Evans Creek project is located within the project area. The project will deepen the upstream and downstream ends of Evans Creek to improve tidal flushing. Two main areas within the creek will be dredged, approximately 1400 feet in length.

Site 5 West is located north of the project area and this project will restore the historic hydrology through a berm breech and an oxbow reconnection (a distance of 75 linear feet). Based on an analysis of historic aerial photographs, the oxbow was not historically connected, but as stated in the NFSLR Aquatic Preserve Management Plan (2009), the water is stagnant and a restored connection will benefit the AP.

The Riverplace Upstream is located north of the project area and the project will provide a re-connection of the upstream end of the Riverplace oxbow to the NFSLR to rehydrate wetlands. This segment has a main (historical) channel that is poorly connected to the NFSLR. In addition, a berm will be removed that isolates the north branch from the NFSLR. The main channel will be widened and deepened at this location.

The Otter Trail Project is located within the Oxbow Eco-Center, north of the project area. Otter Trail is an unimproved trail that follows the NFSLR shoreline. The northern part of the project will involve a berm breech with a new culvert to rehydrate the historical floodplain that runs along the west side of Otter Trail at the Oxbow Eco-Center. The southern part of the project will involve another berm breech to reconnect an oxbow. This project will improve the river shoreline for a total distance of 80 feet. A pedestrian boardwalk will also be constructed to maintain access from the existing Oxbow Eco-Center Otter Trail. As of June 2013 FDEP is considering replacement of this project with five baffle box projects.

All projects have been conceptually designed and permit applications are underway. Based on a pre-application meeting with the SFWMD, the following state permits for these projects are needed:

- Evans Creek: Noticed General Permit (NGP) under 40E-400.485 FAC if the Secretary of FDEP approves the project, or Individual Permit;
- Site 5 West: NGP under 40E-400.485 FAC if Secretary of FDEP approves the project, or Individual Permit;
- River Place Upstream: Standard General Permit; and
- Otter Trail: Standard General Permit modification to existing permit 56-04164-P.

Section 404 permits will be required by the USACE and the permitting requirements are currently being reviewed. All permit documents will evaluate each project with UMAM to ensure the project will provide a functional gain due to water quality improvements, wetland function improvement, and floodplain/oxbow reconnections. Final design and permitting of all projects is expected to be completed by fall 2013 and construction is anticipated to be completed by spring 2014.

6.7.2 Land Acquisitions

For the land acquisition portion of the MOU, several City-owned parcels will be transferred to public ownership. FDEP has stated the parcels totaling 108.55 acres will satisfy the land acquisition portion of the MOU.[48] One of these parcels (Evans Property) is FDEP's highest priority for land acquisition and is located

[48] Letter from FDEP Division of State Lands, dated May 25, 2012 (**Appendix M).**

adjacent to the AP within the project area (**Figure 6.10**). It has been transferred to City ownership. It is a 49.81-acre parcel with 43.33 acres (87 percent) of mangrove habitat. In addition to this parcel, the City has identified 58.74 acres of City-owned property available as proprietary mitigation. Two of the parcels were identified by FDEP as high priority lands for acquisition (Green River and Bywood). All purchased lands will be enhanced by the removal of invasive plant species (as directed by the FDEP) for a period of five years at which time the maintenance of the parcels will be transferred to FDEP. This will provide an additional 108.55 acres of property that will be conveyed to the Board of Trustees. After the transfer to state ownership, the acquired lands will be maintained by FDEP as part of its management of the surrounding and adjacent lands.[49] The acquired land will remain in public ownership and will be preserved in perpetuity.[50]

6.7.3 Recreational Improvements

Three projects are proposed as recreational/educational improvements for existing facilities within or near the project area. One project will include the relocation and improvement of the Halpatiokee Canoe and Nature Trail (**Figure 6.11**). Halpatiokee will be relocated approximately 1,000 feet to the south. This project is designed to relocate and improve the existing Halpatiokee facility that will be displaced by the Preferred Alternative. The new facility will provide a direct connection to Evans Creek and will provide improvements over existing conditions (new entrance and signage, canoe and kayak launch dock, parking area, trailer parking, restroom, boardwalk, 12-foot by 24-foot pavilion, and kiosk). The second project involves improvements to the Savannas Preserve Education Center by constructing new laboratory and classroom space at the learning center (**Figure 6.12**). Improvements will be made to the entrance and parking. A paved 6-foot wide trail will be constructed along the existing Glass Lizard Trail with an overlook and boardwalk into the marsh habitat. SFWMD will require a Noticed General Permit or a No-Notice General Permit addressing surface water management for all projects; the USACE will require a permit only for the canoe and kayak launch dock. Final design and permitting of all projects is underway and construction for all recreational/educational improvement projects is expected to be completed by the summer of 2014. The third project will include the design and construction of a 10-foot wide paved multiuse trail located in the Savannas Recreation Area between Savannah Road and Midway Road (north of the project area; **Figure 6.13**). The trail will be located between Camp Ground Road and the F.E.C. railroad tracks. The design includes two bridges, up to four boardwalks, and at least one observation tower and vista.

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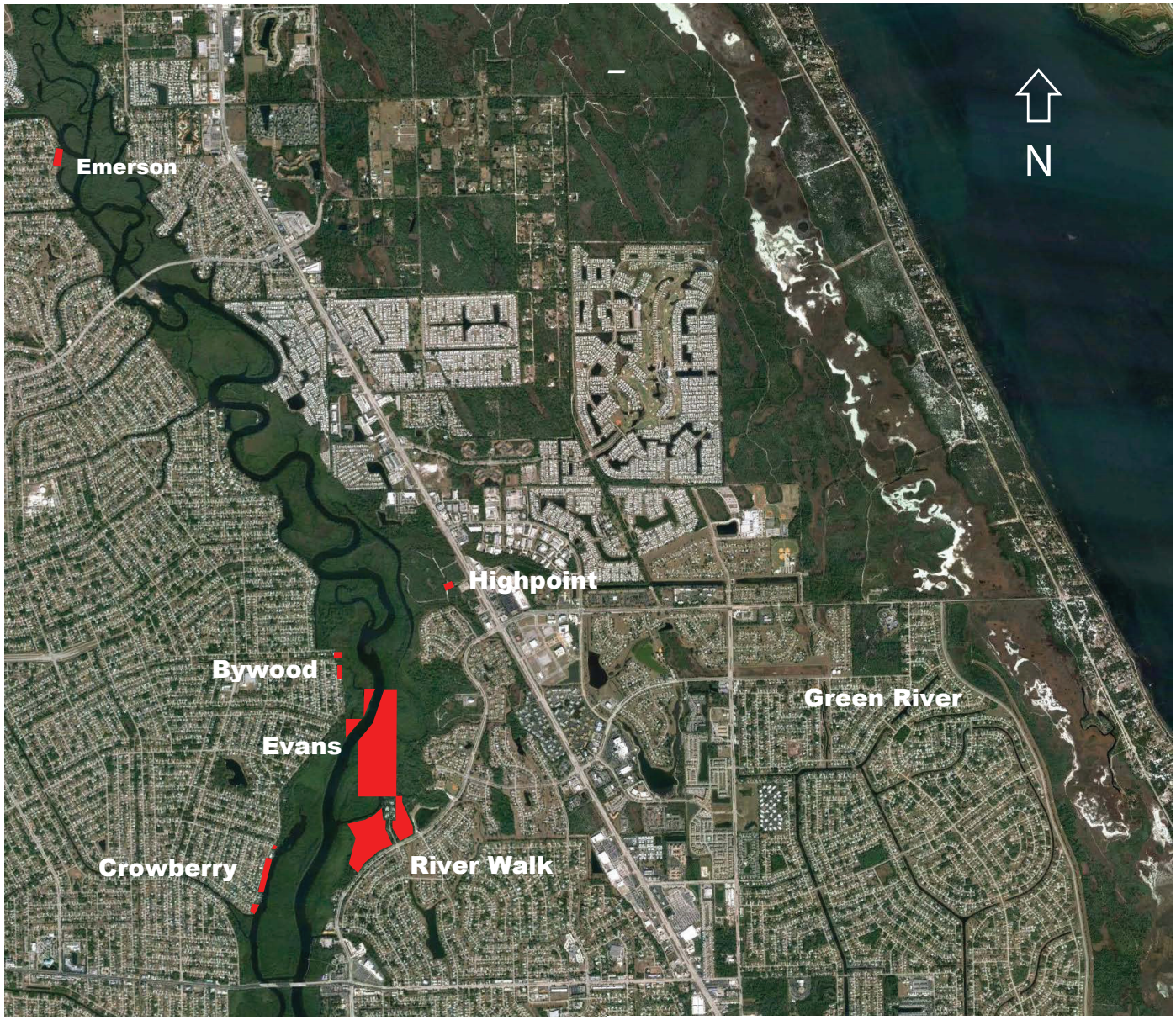
[49] Management of the AP and surrounding lands are described in the NFSLR Aquatic Preserve Management Plan (2009).

[50] Restrictive language regarding the disposition of state-owned lands is included in the Florida Constitution, Article 10, Section 18; Section 253.034(6) FAC; Section 253.034(6)(e) FAC; and Section 18-2.021(7) FAC.



City Owned Properties	
Emerson	2.83
Bywood	1.08
Evans	49.81
Crowberry	3.73
River Walk	35.22
Green River	15.50
Highpoint	0.38
TOTAL	108.55 Acres

6.55

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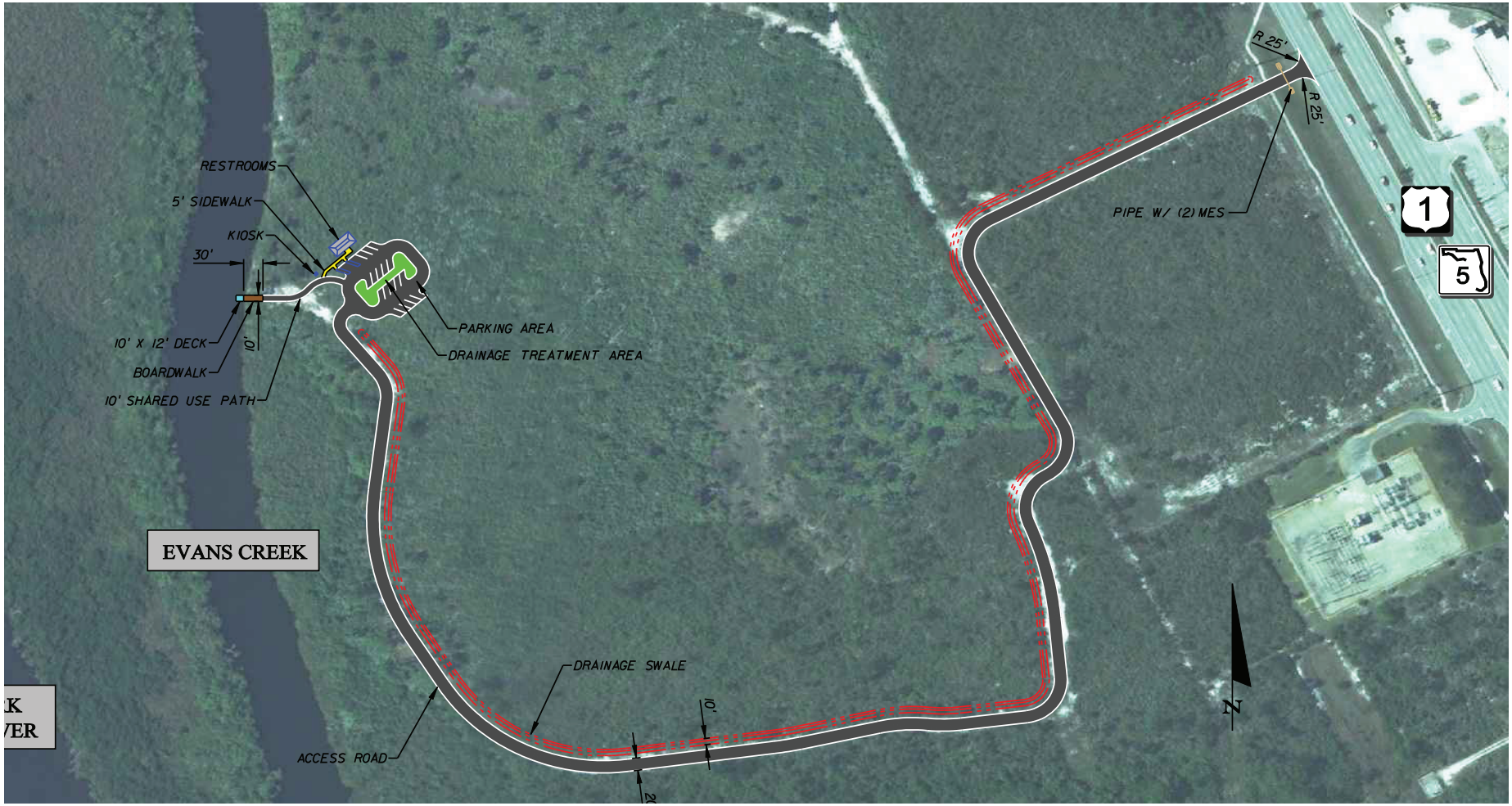
Land Acquisition Sites

Figure 6.10



Source: American Consulting Engineers of Florida, LLC.

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ETDM No. 8247

Crosstown Parkway Extension PD&E Study and Environmental Impact Statement
Halpatiokee Canoe and Nature Trail Improvements
Figure 6.11

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Savannas Education Center

Figure 6.12

Project Location Map
Savannas Recreational Trail - St. Lucie County

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Crosstown Parkway Extension PD&E Study and Environmental Impact Statement

Savannas Recreational Trail

Figure 6.13

6.7.4 Benefits of the Proprietary Mitigation Plan

The ARC Committee has recommended approval to grant the easement (16.1 acres) across state-owned lands, which will be valid for the Preferred Alternative.[51] After the Proprietary Mitigation Plan projects are constructed, it is anticipated the Board of Trustees will convey to the City the easement to cross state-owned lands. All proprietary mitigation projects will be constructed after the Record of Decision is approved, with completion dates in the year 2014. After the Record of Decision is approved, the acquired lands will be conveyed to the state. At the completion of the Proprietary Mitigation Plan:

- Ownership of lands within the SPSP will increase by 108.55 acres over existing conditions.
- The easement will authorize the crossing of 960 linear feet of shoreline (160 feet along each shoreline pair for three crossings for the Preferred Alternative); the acquired lands will increase the linear feet of shoreline under state ownership by 12,645 feet, or a net increase of 11,685 feet.
- Three improved recreational/educational projects will be completed within the SPSP.
- Four water quality improvement projects will restore or improve historic river flows and will improve an estimated 22.16 acres of open water and will reconnect an estimated 28.05 acres of degraded floodplain wetlands to flows from the NFSLR.[52] These projects will also increase the feeding, breeding, and nursery habitat for fish within the NFSLR.
- The water quality improvement projects will improve 255 feet of NFSLR shoreline.
- The water quality improvement projects will re-establish wetland habitat diversity directly adjacent to the NFSLR for threatened and endangered species and species of special concern.

The Proprietary Mitigation Plan is compatible with the goals associated with the Indian River Lagoon (IRL) Surface Water Improvement and Management (SWIM) Plan / Northfork Floodplain Restoration Plan,[53] the St. Lucie County Comprehensive Plan, and the IRL Comprehensive Management Plan by restoring wetland and floodplain functions along the NFSLR floodplain. As a result of avoidance and minimization measures, all possible planning has been conducted to minimize the use of Section 4(f) resources. The Proprietary Mitigation Plan and the Regulatory Mitigation Plan provide ecological benefits to state-owned lands and the features that qualify them as Section 4(f) properties.

6.8 Conclusions

Three properties located within the project area are Section 4(f) properties: North Fork St. Lucie River Aquatic Preserve (AP), the Savannas Preserve State Park (SPSP), and Kiwanis Park. A Section 4(f) evaluation was conducted to determine whether a prudent and feasible alternative existed to avoid a use of these properties. The evaluation also examined if the proposed action would have a constructive use and evaluated measures to minimize harm.

Based on the discussions contained in Section 6.2 (Avoidance Alternatives), Section 6.3 (Measures to Minimize Harm), Section 6.4 (Use of Section 4(f) Properties), and Section 6.6 (Evaluation of Alternatives), no feasible and prudent alternative exists to avoid a new crossing of the NFSLR. In addition, no feasible

[51] ARC Public Hearing and Council Meeting, December 11, 2009; **Appendix M**.
[52] Source: NFSLR Aquatic Preserve Management Plan, 2009.
[53] Email from USACE, dated August 2, 2012 (**Appendix A**).

and prudent alternative exists to completely span the AP and the SPSP. Numerous bridging options were examined to bridge the AP and the SPSP. The bridging option with a pile bent substructure is the most viable and least harmful option for crossing the AP and the SPSP. Thus, all build alternatives; including the Preferred Alternative, would use the AP and all build alternatives except Alternative 6A would use the SPSP (Alternative 6A is located north of the boundaries of the SPSP). Only Alternative 2D would use Kiwanis Park.

Table 6.6 summarizes the use of Section 4(f) properties for the build alternatives. Based on a least harm evaluation, Alternatives 2D, 1F, 6B, and 6A have been eliminated from further consideration. Of the two remaining alternatives (2A and 1C), Alternative 1C would result in the least overall net harm. Coordination has been ongoing with the FDEP, the agency with management authority over the AP and the SPSP, to address the use of these properties and to develop a compensatory mitigation plan for the use of Section 4(f) properties. This resulted in the development of a Proprietary Mitigation Plan, which provides compensatory mitigation for obtaining an easement to cross state-owned lands and also compensates for the use of Section 4(f) properties and the features that qualify them as Section 4(f) properties. Details of the Proprietary Mitigation Plan are contained in Section 6.7 (Compensatory Mitigation for Section 4(f) Uses). A Regulatory Mitigation Plan was also developed for the project. The Regulatory Mitigation Plan provides compensatory mitigation for unavoidable direct and indirect impacts to wetlands, SSL, and navigable and non-navigable waters, as required under federal and state regulations. The Regulatory Mitigation Plan also provides ecological benefits to the Section 4(f) properties.

Table 6.8 compares the build alternatives in terms of use and the Proprietary Mitigation Plan. Of the two remaining alternatives (Alternatives 2A and 1C), Alternative 1C has the least overall net harm. It has fewer social impacts than any other build alternative, it has the least number of residential relocations, and it requires no business relocations. Thus, for purposes of Section 4(f), Alternative 1C has been selected as the Preferred Alternative. Following the selection of the Preferred Alternative, additional avoidance and minimization measures were developed through coordination with the resource agencies, which further reduced the use of Section 4(f) properties. Thus, all possible planning to minimize harm and mitigate for adverse impacts has been incorporated into the Preferred Alternative.

The Preferred Alternative, with the reduced bridge typical section, will use 0.02 acres of the AP. It will use 2.14 acres of the SPSP (reduced from 2.21 acres). It will not use lands from Kiwanis Park. It will affect Halpatiokee Canoe and Nature Trail (Halpatiokee). Halpatiokee is the only land-based public access to the portion of SPSP west of U.S. 1 (the Preferred alternative will have no effect on the portion of the SPSP east of U.S. 1 and motorized boat access will remain unaffected). The existing facility is not well-maintained, is often inundated or flooded, and involves a 0.3-mile portage to the canoe stopover dock on Evans Creek. The FDEP, the agency with management jurisdiction over this facility, has approved the relocation of Halpatiokee 1,000 feet to the south and the construction of an improved facility with a direct connection to Evans Creek.[54]

Based on the analyses contained in this Section 4(f) evaluation, unique or unusual factors are involved in the use of alternatives that avoid Section 4(f) properties, and the cost, social, economic, and environmental impacts, or community disruption resulting from such alternatives reach extraordinary magnitudes.

[54] Meeting minutes between the City and FDEP, August 17, 2010 and October 5, 2010 (**Appendix I**). This agreement is also contained in the Memorandum of Understanding between the City and FDEP (**Appendix L**).

Table 6.8 Comparison of Alternatives, Compensatory Mitigation, and Least Net Harm to Section 4(f) Properties

Alternative	Uses Section 4(f) lands?	Compensatory Mitigation Plan[1]	Least Net Harm to Section 4(f) Properties after Mitigation
2A	Yes	0.02 acres of use in AP compensated by 22.16 acres of open water improvements and 28.05 acres of reconnected floodplains; 5.33 acres of use in SPSP compensated by the acquisition of 108.55 acres; Halpatiokee Canoe and Nature Trail relocated and improved; new recreational improvements at SPSP.	Second least net harm. Has environmental benefit to Section 4(f) properties after compensatory mitigation; some social impacts and residential relocations near western terminus.
2D	Yes	Same use as for Alternative 2A; mitigation for 1.06 acres of use in Kiwanis Park with improved public access to park via Floresta Drive and additional recreational trails and access to SPSP (Halpatiokee Canoe and Nature Trail relocated and improved and new SPSP recreational improvements).	
1C	Yes	0.02 acres of use in AP compensated by 22.16 acres of open water improvements and 28.05 acres of reconnected floodplains; 2.21 acres of use in SPSP compensated by the acquisition of 108.55 acres; Halpatiokee Canoe and Nature Trail relocated and improved; new recreational improvements at SPSP.	Least net harm. Has environmental benefit to Section 4(f) properties after compensatory mitigation; fewer social impacts than any other build alternative; least number of residential relocations, no business relocations.
1F	Yes	0.01 acres of use in AP compensated by 22.16 acres of open water improvements and 28.05 acres of reconnected floodplains; 4.27 acres of use in SPSP compensated by the acquisition of 108.55 acres; Halpatiokee Canoe and Nature Trail relocated and improved; recreational improvements at SPSP.	
6B	Yes	0.01 acres of use in AP compensated by 22.16 acres of open water improvements and 28.05 acres of reconnected floodplains; 2.83 acres of use in SPSP compensated by the acquisition of 108.55 acres; Halpatiokee Canoe and Nature Trail relocated and improved; new recreational improvements at SPSP.	
6A	Yes	0.01 acres of use in AP compensated by 22.16 acres of open water improvements and 28.05 acres of reconnected floodplains; 0 acres of use in SPSP compensated by the acquisition of 108.55 acres; Halpatiokee Canoe and Nature Trail relocated and improved; new recreational improvements at SPSP.	
No Build	No	None	Not applicable

[1] The City has agreed to a compensatory mitigation plan for impacts to wetlands, Sovereignty Submerged Lands, and use of state-owned lands under a Memorandum of Understanding between the City and the state. The mitigation plan is the same for all build alternatives, including the Preferred Alternative.

Shaded cells indicate alternatives that were eliminated as non-viable alternatives from a net harm evaluation compared to Alternative 1C or Alternative 2A.

Alternative 1C has the least net harm to Section 4(f) resources and it has been selected as the Preferred Alternative. Based on the above considerations, there is no feasible and prudent alternative to the use of land from the AP and the SPSP and the proposed action includes all possible planning to minimize harm to the AP and the SPSP resulting from such use.

6.9 Coordination

FHWA makes DOAs based, in large part, on information provided by the agencies that have jurisdiction over the Section 4(f) resource(s). To obtain this information, coordination was undertaken with the agencies that have jurisdiction over the AP, SPSP, and Kiwanis Park. FDEP is the jurisdictional agency for the AP and SPSP. Letters dated July 3, 2007 and October 9, 2008 (located in the project file) were transmitted to FDEP requesting information pertinent to the state resources. Responses were received from FDEP via letter dated July 25, 2007, August 7, 2007, and electronic mail dated November 24, 2008 (**Appendix A**).

The City's Parks and Recreation Department has jurisdiction over Kiwanis Park. Information regarding this park was via electronic mails dated March 4, 2009 and March 9, 2009 (located in the project file). Coordination with all agencies resulted in the generation of sufficient information to provide a DOA for each of the Section 4(f) resources.

Throughout the NEPA process, the City has coordinated with the cooperating agencies and state agencies, including the FDEP (the agency with jurisdiction over the AP and the SPSP) during monthly progress meetings. After the DEIS was made available for public comment, the City coordinated with each agency regarding avoidance alternatives, minimization measures, and temporary occupancies. The USFWS objected to the conversion of publicly-owned lands for a non-conservation purpose through a dispute resolution. Coordination with this agency has resulted in the resolution of the dispute.[55] The cooperating agencies were kept informed during the development of the Proprietary Mitigation Plan (**Appendix M**). Coordination with the FDEP regarding temporary occupancy during construction has been completed.[56] Coordination has occurred with the Headquarters Offices of the Department of Interior (National Parks Service) regarding Section 4(f) issues.[57] Copies of all formal and informal coordination referred to in this Section 4(f) evaluation are contained in **Appendix A** and **Appendix I** and are summarized in Section 8.0 (Comments and Coordination) of this EIS.

[55] Email from USFWS, dated November 28, 2012 (**Appendix A**).
[56] Letter from Matthew Klein, FDEP, dated January 30, 2013 (**Appendix A**).
[57] Record of Telephone Conversation, National Parks Service, dated July 11, 2012 (**Appendix I**).